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POLICY OPTIONS TO PREVENT CLIMATE CHANGE

HEARING

BEFORE THE

COMMITTEE ON WAYS AND MEANS U.S. HOUSE OF REPRESENTATIVES

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POLICY OPTIONS TO PREVENT CLIMATE CHANGE

THURSDAY, SEPTEMBER 18, 2008

U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON WAYS AND MEANS,
Washington, DC.

The Committee met, pursuant to notice, at 10:35 a.m., in room 1100, Longworth House Office Building, Hon. Charles B. Rangel (Chairman of the Committee), presiding.

[The advisory announcing the hearing follows:]

ADVISORY

FROM THE COMMITTEE ON WAYS AND MEANS

FOR IMMEDIATE RELEASE
September 11, 2008
FC–22

CONTACT: (202) 225–5522

Chairman Rangel Announces a Hearing on Policy Options to Prevent Climate Change

House Ways and Means Committee Chairman Charles B. Rangel today announced the Committee will continue its series of hearings on climate change. The next hearing will focus on policy options for reducing greenhouse gas emissions. A number of proposals have been referred to the Ways and Means Committee in the 110th Congress (e.g., H.R. 2069—The Save Our Climate Act of 2007 (Rep. Stark), H.R. 6316—The Climate MATTERS (Market, Auction, Trust & Trade Emissions Reduction System) Act of 2008 (Rep. Doggett), H.R. 3416—The America's Energy Security Trust Fund Act of 2007 (Rep. Larson), and H.R. 6186—The Investing in Climate Action and Protection Act of 2008 (Rep. Markey)). **This hearing will take place on Thursday, September 18, 2008, beginning at 10:30 a.m. in the main committee hearing room, 1100 Longworth House Office Building.**

In view of the limited time available to hear witnesses, oral testimony at this hearing will be from invited witnesses only. However, any individual or organization not scheduled for an oral appearance may submit a written statement for consideration by the Committee and for inclusion in the printed record of the hearing. A list of invited witnesses will follow.

BACKGROUND:

The Committee on Ways and Means has previously heard testimony that human greenhouse gas emissions are having an adverse impact on our planet's climate. These witnesses testified that the United States "must enact and implement a comprehensive national mandatory market-based program to progressively and significantly reduce U.S. greenhouse gas emissions in a manner that contributes to sustained economic growth." Since that hearing, a number of legislative proposals have been introduced in the House of Representatives, and been referred to the Ways and Means Committee, that would implement market-based programs to reduce greenhouse gas emissions in the United States.

There is bipartisan support for action to address climate change. Senior lawmakers on both sides of the aisle have proposed enacting mandatory economy-wide cap and trade programs to reduce greenhouse gas emissions. Their proposals, like other proposals introduced in the 110th Congress, would contain revenue measures (e.g., auctions of carbon allowances) that are within the jurisdiction of the Committee on Ways and Means. In addition, many of the market-based climate change proposals include import requirements that are within the Committee's jurisdiction. This hearing will mark the beginning of the Committee's work on this important issue.

FOCUS OF THE HEARING:

The hearing will focus on the policy options that are available for reducing greenhouse gas emissions in the United States and will examine the design choices presented by these options. In particular, the Committee will explore the revenue components of these policy options. The Committee will also explore proposals to promote a comprehensive global effort to address climate change and to ensure a level regulatory playing field for U.S. manufacturers. The hearing will also focus on the potential costs that could be imposed on the U.S. economy if Congress fails to act to reduce U.S. greenhouse gas emissions and the economic growth opportunities that would arise from implementing a market-based program to reduce U.S. greenhouse gas emissions.

DETAILS FOR SUBMISSION OF WRITTEN COMMENTS:

Please Note: Any person(s) and/or organization(s) wishing to submit for the hearing record must follow the appropriate link on the hearing page of the Committee website and complete the informational forms. From the Committee homepage, *http://waysandmeans.house.gov*, select "*110th Congress*" from the menu entitled, "*Committee Hearings*" (*http://waysandmeans.house.gov/Hearings.asp?congress=18*). Select the hearing for which you would like to submit, and click on the link entitled, "*Click here to provide a submission for the record*." Once you have followed the online instructions, complete all informational forms. ATTACH your submission as a Word or WordPerfect document, in compliance with the formatting requirements listed below, by close of business on **Thursday, October 2, 2008**. **Finally**, please note that due to the change in House mail policy, the U.S. Capitol Police will refuse sealed-package deliveries to all House Office Buildings. For questions, or if you encounter technical problems, please call (202) 225–1721.

FORMATTING REQUIREMENTS:

The Committee relies on electronic submissions for printing the official hearing record. As always, submissions will be included in the record according to the discretion of the Committee. The Committee will not alter the content of your submission, but we reserve the right to format it according to our guidelines. Any submission provided to the Committee by a witness, any supplementary materials submitted for the printed record, and any written comments in response to a request for written comments must conform to the guidelines listed below. Any submission or supplementary item not in compliance with these guidelines will not be printed, but will be maintained in the Committee files for review and use by the Committee.

1. All submissions and supplementary materials must be provided in Word or WordPerfect format and MUST NOT exceed a total of 10 pages, including attachments. Witnesses and submitters are advised that the Committee relies on electronic submissions for printing the official hearing record.

2. Copies of whole documents submitted as exhibit material will not be accepted for printing. Instead, exhibit material should be referenced and quoted or paraphrased. All exhibit material not meeting these specifications will be maintained in the Committee files for review and use by the Committee.

3. All submissions must include a list of all clients, persons, and/or organizations on whose behalf the witness appears. A supplemental sheet must accompany each submission listing the name, company, address, telephone and fax numbers of each witness.

Note: All Committee advisories and news releases are available on the World Wide Web at *http://waysandmeans.house.gov*.

The Committee seeks to make its facilities accessible to persons with disabilities. If you are in need of special accommodations, please call 202–225–1721 or 202–226–3411 TDD/TTY in advance of the event (four business days' notice is requested). Questions with regard to special accommodation needs in general (including availability of Committee materials in alternative formats) may be directed to the Committee as noted above.

Chairman RANGEL. For our visitors, excluding Members—they can take their time—please take seats. Thank you so much.

This is the first time this Committee is meeting without the presence of our beloved colleague, Stephanie Tubbs Jones. Before I yield to my friend, Jim McCrery, I think we all can agree, especially those of us on the majority side, that she was an overwhelming personality, she brought a sense of humor during the tensions that we Democrats have, and even when we're working together in a bipartisan way. She was a dedicated public service pioneer, a history maker, and her memory is going to be with this Committee and this Congress and this country for a long, long time.

On this, I would like to yield to Jim McCrery, who has expressed a deep fondness and—for her and her memory.

Mr. MCCRERY. Thank you, Mr. Chairman. Certainly our gathering today without our friend, Ms. Tubbs Jones, is not a happy occasion. We all came to know her on this Committee as a vivacious personality, but a—to put it mildly, an enthusiastic advocate for positions that she believed in very strongly. I know that all of my colleagues on the Committee share my appreciation for her life and her contributions to this Committee and to this Congress and to her community and to this Nation.

So, Mr. Chairman, if you don't mind, I would suggest just a few moments of silence in her memory before we proceed.

Chairman RANGEL. I would like to have included in that prayer the loss of Vicky Levin, who was the beloved wife of our dear friend and my brother, Sandy Levin.

For those of you who haven't met or traveled with her, then you have missed out on one of the most exciting personalities and intellectual people that you will meet in life. She was a wonderful woman and, for over 50 years, the sweetheart of Sandy, and the mother of their four wonderful children. You may not have known, but Sandy spent days and weeks at the hospital, never, but never, giving up. He is a strong Member, and I hope that we would include her memory along with Stephanie, as we pause now for a moment of silence.

[A moment of silence was observed.]

Chairman RANGEL. Jim McCrery, I hope the witnesses don't think we do this often. But this is the last time that we expect this year to be meeting as a full Committee.

After a decade of us hardly knowing each other's names, Jim McCrery and I met to decide that, whatever differences that we had, it was the Committee, the Congress, and our country that should take a priority. We have really worked together, succeeded in a lot of issues. But even the Committee Members will not know the obstacles that, working together, we have overcome to remove the possibility of having a partisan fight.

Jim, not only are you going to be missed, but I have been talking to Members on your side in saying that whatever we lose or gain next year, let us try to maintain what you have done. It hasn't been easy on your side, and I have had a lot of difficulty on my side, because people like to fight, like to fight. But we have done a great job under your leadership, and we are going to meet formally to express it individually.

I would like to say, also, happy birthday.

Mr. MCCRERY. Thank you, Mr. Chairman. Right back at you.

Chairman RANGEL. Chairman McNulty of Social Security is an old friend to us New Yorkers. Not only has he served here, in the Congress, but he is an old-time member of the New York State Assembly.

Since the assembly meets in our State capital, in Albany, he still visits the capital. I don't know where he intends to reside, but it seems to me that even though, formally, he's leaving, we should not be too surprised if we find him in the Congress and the Committee. Happy birthday to you.

Mr. MCNULTY. Thank you, Mr. Chairman. I want to thank all of the Members and everyone here in Washington for the many kindnesses which have been extended to me over the past 20 years here in Congress, and throughout my 39 years as an elected public official, and all the blessings that I have received throughout my life. Thank you, Mr. Chairman.

Chairman RANGEL. Happy birthday to you, as well. Our buddy, Jim Ramstad, will be leaving. Representative Weller, Representative—well, how many Members in—Lewis will not be with us. Well, we can say it's—we can say that we will be meeting on Wednesday, we will talk about that.

Let's get on with the business of the Committee, as we attack this very serious problem that our Nation is facing, recognizing that there is no Democratic or Republican solution, and also knowing that this hearing is not really to find a solution, but really to discuss the options.

As I told Congressman Camp yesterday, that we hope that if there are other ideas that this hearing doesn't cover because of our lack of sophistication as to exactly what we have to do this year, I want the Minority here and the Minority that comes back to realize that we will have hearings and try to educate ourselves as to how we, as a Congress, Congress and country, can tackle this serious problem.

Now, we get to Mike Bloomberg, who is absolutely bigger than life in our city. We are just so proud that he represents our city and our country, and in the world, in terms of being able to feel the independence of the intellect to do the right thing, not politically, but to do the right thing for the people, which he has been sworn to serve. I told him this morning that he sets an example of what a handsome, intelligent, personable billionaire can do, once they make their mind up that they're going to be a public servant.

We hope that this Committee will be able to serve the next President with some ideas so that we can hit the ground running. We have leadership from the business community that recognize that this has to be handled in a bipartisan way. So, therefore, we hope that Members on both sides will try to keep their leadership, as it relates to their party, out of it as we try to see what climate change legislation we can ultimately be able to recommend, no matter who is the President of the United States.

We also have to make certain that whatever we do is consistent with the World Trade Organization rules. I am certain that at the end of these hearings, that we will be better informed—and to also remember that while we share jurisdiction on this with other Committees, they still will be looking to us as providing the leadership on which way the Congress goes.

So, I think our first witness here—my Mayor, isn't it, staff? Isn't my Mayor the first witness? Oh, yes.

Because so many of our Members have worked so hard on this issue, I would like to first yield to my partner on this, Jim McCrery, to make and to recognize whatever Members he sees fit, to let you know that this is not the beginning, but an ongoing process that we're just trying to bring there. So, Jim, I yield.

Mr. MCCRERY. Thank you, Mr. Chairman, and I appreciate your recognizing and asserting this Committee's jurisdiction over

this issue. We certainly should play an important role in developing policy with respect to this issue and other issues that it might affect.

Last February, we held our first hearing on climate change issues. At that time, I suggested that any legislation designed to address global climate change should be examined in the context of America's need for energy security. On the day of that hearing, the average price of a gallon of gasoline in the United States was about $2.42. It's now about $3.75. Even though global crude oil prices are falling, the devastation caused by Hurricane Ike, particularly on our strained refining capacity, threatens to push those prices even higher.

As we listen to today's witnesses, I hope we will keep those prices in mind and ask those witnesses and ourselves how much higher carbon taxes or cap and trade systems might push energy prices in this country.

We also need to examine how those higher prices translate into job losses, both from the contraction of our economy, as well as from the movement of manufacturing jobs to countries that don't take similar steps to reduce carbon emissions.

Perhaps just as importantly, we should ask whether those higher prices would result in any measurable reductions in any global greenhouse gas emissions and global temperatures.

When considering the answer to those questions, I believe we ought to keep in mind how likely it is that other countries won't match our actions. China is now recognized as perhaps emitting more carbon than the United States. While our emissions growth is relatively flat, China's is still going up at a pretty good pace, as are emissions from other fast expanding economies like India.

Those countries have made clear they have no intention of slowing their economies with restrictions on carbon emissions. So, if we raise energy taxes on our manufacturers, they may respond by moving their production to countries that do not impose such costs. I suppose offshoring manufacturing jobs is one way, though, for us to meet new emission targets.

But if those jobs move to countries who are less carbon efficient, then not only have we shipped jobs abroad, we have also increased, not decreased, total greenhouse global emissions.

I expect we will hear from witnesses today that climate change is a global problem, meaning that a ton of carbon emitted in New Delhi has the same effect as one emitted in New York. So, cutting carbon emissions at home, while increasing them abroad, will not reduce the dangers that many have warned us about. In fact, it could exacerbate them.

Mr. Chairman, as this hearing proceeds, I hope we will ask three questions: number one, how much will a carbon reduction plan raise energy prices; number two, what damage will it do to our economy; and three, how will those changes impact the global climate? Together, I think those questions will show the deep flaws of carbon taxes and cap and trade, flaws which we should not ignore.

Some might suggest that doing nothing is not an alternative. While I would prefer to do something that is constructive, if doing something that makes us feel better about ourselves comes at the

cost of hurting our economy and raising greenhouse gas emissions worldwide, I think we are better off rejecting cap and trade or carbon taxes.

So, Mr. Chairman, there is a variety of things I think, ultimately, this Committee and others should look at in this area of global climate change. We have supported a variety of tax changes, for example, to encourage alternative energy and conservation. We can look at those and perhaps expand those efforts, encourage the research and development to bring about further breakthroughs that reduce our reliance on fossil fuels without crippling our economy.

We could also encourage trade and equipment and technology that speeds the spread of those advances around the world. Of course, we, as you suggested, need to make sure that we do that in a WTO-compliant way.

Mr. Chairman, I will close by noting that there is one feature of this issue about which there should be bipartisan agreement, and I have already touched on this. This hearing should serve notice to the next Congress that so many of the issues surrounding a cap and trade system, including the allocation of auction revenue and measures designed to mitigate the leakage of jobs, are squarely within the expertise and jurisdiction of this Committee and its Members.

I won't be here next year, but I hope all Members will keep in mind the importance of this panel's active participation in the molding of any climate change legislation that might move in the 111th Congress. We have lots of talent on this Committee, Mr. Chairman. Both sides, Republicans and Democrats, have worked hard to make sure we have some of our brightest and best Members take seats on this Committee.

So, I will look forward to watching next year, as this Committee takes a leading role in fashioning whatever policies ultimately emerge from the Congress on this issue. Thank you, Mr. Chairman.

Chairman RANGEL. Thank you, Jim. I have been advised by staff that several Members on the outside would like to share their views and opening remarks. In view of the fact that we have so many witnesses and panels, I would encourage you to keep your remarks to 2 minutes, and that we will recognize, in this order, not necessarily—we will try to find out whether any of the other Members would care to speak. But Mr. Stark, Mr. Doggett, Mr. Larson, Mr. Blumenthal [sic], and you can determine.

The Chairman yields 2 minutes to Mr. Stark.

Mr. STARK. I would yield back, Mr. Chairman.

Chairman RANGEL. Mr. Doggett.

Mr. DOGGETT. Thank you so much, Mr. Chairman, for advancing our efforts to perfect the best possible solution to the global warming crisis.

The science is in, the consensus is clear, that global warming is real, and that the consequences are already impacting us.

The cost of inaction is much greater than the cost of a well-crafted legislative solution. The cost of continuing to do nothing is impacting much more than polar bears. It will start hurting consumers where they live, not just in some exotic place in a travel magazine. It will hit families in their pocketbooks, as they're al-

ready reeling from the high price of our addiction to fossil fuels. Inaction endangers our health, our wealth, and our national security.

Ninety-two Members of this House, including a majority of the Democratic Members of this Committee on Ways and Means, are sponsors of H.R. 6316, the Climate Matters Act. It is the first cap and trade legislation to receive primary referral to this Committee.

H.R. 6316 places a strong but achievable cap, a limitation on greenhouse gas emissions, which can be coordinated in an auction, a Treasury-administrated auction, and which will then rely on the free market to set a cost on a pollution by the ton.

When we introduce an improved version of this bill in the next Congress, I sincerely hope that it will gain bipartisan support. But whatever your view on the mechanics of this particular bill, Ranking Member McCrery has made clear that we should have unanimity in this Committee about our active role on this very critical issue.

As today's witnesses will make clear, transitioning to a less carbon-dependent economy will involve the raising of hundreds of billions of dollars in new revenue. If we are to maintain competitiveness, Americans must be concerned about the trade implications of this legislation, particularly those countries who initially declined to join the transition to a carbon-free economy.

Revenue and trade are two cornerstones of this Committee's responsibility. The Climate Matters bill also addresses a third, and that's health care. Instead of massive public giveaways or pollute-free cards, the Climate Matters Act would auction allowances, and apply the resulting revenues to a healthy families fund, to address the health care challenges that plague so many American families and businesses.

The cap and trade bill, as one of our witnesses suggests, is also a cap and invest bill investing these auction revenues in infrastructure, in industry, in universities with research and development, in clean energy, in our workforce.

Ten States, from Maryland to Maine in the northeast, in the west six States—excuse me, seven States—including California and four Canadian provinces, are already beginning to implement, at the State level, a cap and trade system. Both of our Presidential candidates, Republican and Democrat, have endorsed a cap and trade system.

I think it's clear that there is a consensus that we can either run the new economy less dependent on fossil fuels, or get run over by it. I look forward to working in good will with all of those willing to fashion legislative solutions, based on good science. I believe that the Climate Matters bill, H.R. 6316, which the witnesses will be addressing, is a good place to begin. Thank you, Mr. Chairman.

Chairman RANGEL. I thank the gentleman for his contribution to this sensitive problem that we face in the country, and I recognize Mr. Herger for 2 minutes.

Mr. HERGER. Thank you, Mr. Chairman. I must express my serious concerns with the proposals to address climate trade, such as cap and trade, that aim to reduce emissions by increasing the cost of energy. Numerous studies that were conducted on cap and trade legislation that was debated by the Senate a few months ago all

concluded that cap and trade would have serious negative effects on our economy.

While the exact numbers differed, all estimates pointed to a reduction in GDP, an increase in energy costs, all of this occurring under an enormous expansion of the Federal Government. At a time when our economy is suffering, and we have seen the serious impact rising energy costs have had on American families, I don't believe Congress should be contemplating further increases in energy costs, and imposing even greater financial strain on our country.

Furthermore, analysis by the EPA shows that even if the U.S. significantly reduced its emissions, global emission levels will continue to increase rapidly under—major developing country emitters also reduce their emissions.

I am concerned that American citizens will be forced to pay higher energy costs, and see their standard of living reduced without seeing any improvement in the global level of emissions.

I believe there are better alternatives to the proposals being considered before the Committee today, those that incentivize energy, innovative technology, without imposing costly new burdens on our economy. One way to do that is through trade liberalizations of technologies that can help us reduce emissions.

Mr. Chairman, I would ask unanimous consent to enter into the record this op ed written by Ambassador Schwab and Australian Trade Minister Crean on the need for positive trade liberalization efforts to address this climate change.

Chairman RANGEL. The Chair hears no objection; so ordered.

[The information follows:]

Mr. HERGER. Again, Mr. Chairman, I thank you for this hearing, but I would think—I would hope that we would take very seriously the incredibly negative potential ramifications that moving in this direction would pose on our Nation.

Chairman RANGEL. Thank you for your contribution. The Chair now recognizes Mr. Larson for the great work that he has done on this issue.

Mr. LARSON. Thank you, Mr. Chairman, and I want to thank the staff and you for putting together this outstanding panel and these 14 panelists who will come before the Members of Congress.

I think the question was appropriately raised by Mr. McCrery, whether or not we face the "fierce urgency of now," as Martin Luther King once ascribed, with respect to our environment and global warming and its effects.

I look forward to the testimony of the panelists, experts in their field, to lay out a path forward for us.

Most importantly, as we go forward, I concur with the Members on the other side of the aisle. Let's look at what will be revenue-neutral. Let's look at taxing polluters upstream, but passing down the benefits downstream to the consumers, reducing payroll taxes, and using our creativity and this Committee's authority to create a system that will provide the opportunity and the innovation and the tax relief that they need, as well.

The question that this Committee will ultimately resolve is, what is the best path forward to take? Is there a fierce urgency of now to act, or is doing nothing a better way to go? If we're going to act,

what's the best course? What's in our economic interests, and how do we secure it in the most feasible, possible, cost-effective manner?

With that, Mr. Chairman, I thank you.

Chairman RANGEL. Thank you for your—thank you so much, Mr. Larson, for your contribution. The Chair now recognizes Congressman Camp.

Mr. CAMP. Well, thank you, Mr. Chairman, I will be very brief. I appreciate you and the Ranking Member asserting the Committee's jurisdiction over this issue. But to say that any market-based approach to climate change would have significant revenue and international trade implications is an understatement.

Let's be clear about what cap and trade would actually do. It would dramatically increase energy prices, specifically for middle- and low-income consumers, and it would increase costs for American manufacturers, and eliminate about half-a-million American jobs each year. It would hamper growth in our economy for the next several decades, while other nations watch us in amusement.

While we're all interested in new and clean technologies in response to higher energy cost and climate change, we must look at those in light of the current economic struggles our country is facing.

So, with that, Mr. Chairman, I look forward to the testimony today, and I want to thank our witnesses for being here, and I yield back the balance of my time.

Chairman RANGEL. Thank you. The last Member that indicated he wanted to share his views on this, is Mr. Blumenauer, who has really gained a nationwide attention for his views on this sensitive subject. The Chair recognizes him for 2 minutes.

Mr. BLUMENAUER. Thank you, Mr. Chairman. I appreciate your courtesy, and I appreciate the sentiment expressed by our Ranking Member about the criticality this has for the mission of this Committee. I think it's appropriate that we conclude this Congress with our first major hearing with a distinguished panel to tie these elements together, because we are in a carbon-constrained, water-stressed, energy-short world.

One of the things that both Presidential candidates agree upon is that the United States is going to join the rest of the world in trying to be proactive in dealing with climate change in the next Administration.

I have been pleased to work with my friend, Mr. Doggett, on one version that gives some choices, that provides, I think, an interesting intersection. Mayor Bloomberg has been a leader, not just in the revitalization of New York City, but leading the charge with Governor Schwarzenegger, Governor Rendell, and others, talking about the need to rebuild and renew America.

Another item critically in the purview of this Committee, as we face a trust fund that is going into deficit for the first time in history, an opportunity for us to tie these elements together, rebuilding and renewing America, dealing with the transportation deficit, and the threat from carbon pollution.

There are many options. We have a choice to put these pieces together in ways that are revenue-neutral, that actually raise revenue for other priorities, or, in fact, could reduce burdens for other

people, as we seek to end the problems associated with carbon pollution.

But one of the things that is clear—and anybody who reads Sir Nicholas Stern's report—I think documents very clearly that the costs of our moving forward and doing nothing, the risks to that, are tremendously greater than simply the short-term, immediate steps that are offered by legislation that are here.

I look forward to working with you and the Committee in moving these proposals forward.

Chairman RANGEL. Thank you so much Mr. Bloomberg—Blumenauer.

Now, Mayor Bloomberg has to leave us, and so I hope that the panel will allow me to call him first. New Yorkers have unfairly been challenged with the idea that we have more self esteem than we really need. One of the reasons for it is because of the outstanding leadership that we have had from our Mayor, who has been willing to take the risks, take the challenges that may be unpopular, but at the end of the day, New York City manages to come out ahead, not only in New York and our State, but indeed, throughout the world.

So, it is a distinct honor for me to be in the position to be introducing him, or to really be presenting him, because we all are thankful for the thoughtfulness that you have, in what can make this a better country.

So, I know you have to leave, but we welcome you to this Committee. Mayor Michael Bloomberg.

STATEMENT OF THE HONORABLE MICHAEL BLOOMBERG, MAYOR, CITY OF NEW YORK, NEW YORK

Mr. BLOOMBERG. Chairman Rangel and Ranking Member McCrery, ladies and gentlemen of Congress, thank you for having me.

I must first put on the record the fact that I am Mayor because of Charlie Rangel. Charlie Rangel urged me back in about the year 2000 to run for mayor. I always listen to Congressman Rangel. I think lots of you would have loved to be listening in on the conversation when I called him and said, "Charlie, I've got good news and bad news." Charlie didn't quite understand we had two parties in New York. Actually, we don't really have two parties in New York, but we'd like to have two parties in New York. Anyway, I am here because of him.

Thank you, all of you. You are here because you are discussing whether or not we should reduce our dependence on fossil fuels. I don't think there is any question that we should.

Whether it is energy independence, whether it is pollution, whether it is economics, there are lots of reasons that we are in a very difficult and bad situation. We are transferring our wealth out of this country over to other countries, some of which don't have the same values we do, and in fact, fund terrorists that try to take away our freedoms. It is a very worrisome thing, and something that I am pleased to see you are addressing.

I also think that reducing our dependence on fossil fuels will increase our economic efficiency and competitiveness, enhance our

national security, improve our air quality, promote public health, and reduce our impact on global climate change.

Now, I did listen to Congressman Camp and Herger and McCrery talk, and I, too—I am a capitalist. Forbes says I have some credentials as a capitalist. But I think that if you take a look at the impact of all of these things, they are positives, rather than negatives. Rupert Murdoch, who has never been known as a tree hugger, and me, from my company, we have both said that News Corp and Bloomberg, L.P., are going to be carbon neutral. It is a competitive advantage to improve the environment.

I worry about overseas competition, but we are better off if we reduce our pollution. You should take a look at the Chinese stock markets, both of which the major markets are off 65 percent this year. A lot of that is because in China they understand they have an enormous pollution problem that will have devastating effects on their economy.

So, I am not terribly concerned about what they will do. I am concerned to make sure that we don't get in a similar situation. I am concerned that we do what is in our own interest. We breathe air that is being polluted today. All of the arguments that say, down the road, if we stop polluting it doesn't matter, because China and India and other countries pollute, maybe long-term that's right. I don't agree with it, but maybe, long-term, it's right. But we are polluting the air that we and our children are breathing right now, right here, and we have to do something about this.

State and local governments have taken the lead, because of the inaction of Congress. But I think you have a chance to rectify that. In New York City, as you know, we have set as a goal for the city itself to reduce by 30 percent by the year 2017 its pollution, its generation of greenhouse gases. That means city-owned buildings, city-owned buses, city-owned police cars, fire trucks, those kinds of things. If we do it, we hope that we can get the private sector to reduce by 30 percent the amount of greenhouse gases that it produces by the year 2030.

We pursued an aggressive, multi-pronged strategy. We stressed conservation, as well as encouraged the use of alternative fuels. We are making progress. Today we are releasing our annual greenhouse gas inventory. We have done an inventory of all of the pollution in New York City, because if you can't measure it, you can't work on it.

The new survey shows that we have reduced our carbon footprint by 2½ percent between 2005 and 2007, thanks mainly to milder weather, and two new efficient power plants. But, nevertheless, we are going in the right direction. Our challenges, however, energy consumption and vehicle traffic, do continue to grow faster than our population, and they demonstrate why, for State and local efforts to be truly effective, they really do have to be matched at a Federal level.

It is a disgrace that Detroit produces cars that are phenomenally energy efficient, but only sells them outside of the United States. When some people say that overseas they are laughing at us because we are talking about improving the environment, you go to Western Europe. They are way ahead of us, and they dislike us because they don't respect us because we're not doing our part.

Now, if we are going to reduce carbon emissions, we really have to use capitalism to do it. I don't think that a managed economy would ever do that. We saw managed economies. They were called things like the USSR and Communism, and they just didn't work. Capitalism does work, but you've got to give an economic incentive for people to do things. That's the essence of capitalism.

Yes, Congressman Camp. You will raise energy prices. But that's exactly what we should do if we want people to use less. That's using the marketplace to achieve a goal that is in everybody's interests.

We have to price carbon at a price where it gives you an incentive to go and to find alternative fuels. You can use a carbon tax, which is what I prefer, simply because it's more straightforward to administer. I don't like taxes any more than anybody else, but if you're going to do something, do it efficiently. Or, you could use a cap and auction system, which would work. Congressman Doggett, you proposed a comprehensive cap and auction system on greenhouse gases. I still would prefer the tax.

But in either case, we have to do something to get people to use less, and to use it smarter. I think there are four quick things that I would like to outline that I think are important in your discussions, if and when you come to some combination or some decision as to how to use capitalism to incent people to be more efficient.

Incidentally, these things are all good for business. I don't know any company that hasn't invested in being more environmentally friendly and reducing their energy consumption that hasn't benefited greatly to their bottom line. So, we're not asking people to do things that aren't in their interests; we are asking people to do things that are in their interest, and collectively, in our interest.

The four things are simply the implementation should be straightforward. What you have seen overseas when we have tried cap and trade systems, if you start giving breaks to people, the cost of administering, it starts to get so great that society is burdened by the cost. That's a lousy idea. That's why I favor the cap and tax. But you could do a cap and trade system.

But you can't have all of the exceptions. You have to have a system that gives people the incentive to reduce carbon emissions, go to alternative fuels, and one that the public and the private sector believes is efficient and is fair.

Now, second, we want to have—you have to have a uniform price. If we start giving particular breaks to certain industries, or to certain parts of the country, you just will not get this done. All you will create is, I think, a big mess. We have to make sure that the amount of—the prices that will come out of the amount of carbon credits that you decide to make available achieve the purpose of getting companies to reduce their emissions, to be more efficient, or to go to alternative fuels.

Third, I think that we have to have some ways to address Congressman Camp or Congressman Herger—I'm sorry—one of you had mentioned the impact on the economy. You are dead right. Having a tax or a fee that reduces carbon emissions by raising the cost of energy is a drag on the economy.

So, rather than create a pinata, where you can just use this money for lots of things, using the money to offset that, I think, should satisfy your concerns and let us do both things.

Job retraining. We, in this country, our public education system is not where it needs to be. Our workers are being left out of the future economy. This is a perfect opportunity to do that.

Reduce payroll taxes. I would like to reduce taxes just as much as anybody else would. The people that are working and paying the payroll taxes are the people that will be hurt. Here is a perfect way to transfer the burden from them, who are going to pay higher energy prices but now have lower taxes, to the producers who are the ones that, in all fairness, because of their actions are giving us the opportunity to pollute the air that we breathe, and to hurt us long term.

Last, I think that carbon tariff on nations that don't sign up to a global agreement may eventually become a necessity. I think we shouldn't think that we can do all of this alone. But America is a country that has always led by example. The defeatism to say, "Well, we can't do it because everybody else is unwilling to do it," isn't where we should be. We should be standing up. We should be leading. We should be improving our environment.

It is disappointing to me, as I travel around the world, that it is other countries that are investing in new technologies, working on alternative fuel sources, retraining their workforce. Long term, that's not good for America. I think if America said, "Look, let's go it alone, let's be the leader," you will find the world wanting to follow us.

So, I appreciate your concerns. Nobody is more cognizant of them than I. But I do think those are ways to address them, and I do think this is a serious issue that we have to address now.

Long term, the global warming, short term, the pollution of the air that you and I breath, and the economy, our economy, is better if we make it more ecologically pure, whatever the word is, because it is—all of these environmental things—are stagnating our economy, and preventing us from attracting the best and the brightest, rather than raising the costs—rather than reducing the cost, they are raising the cost. Thank you.

[The prepared statement of Mr. Bloomberg follows:]

Prepared Statement of The Honorable Michael Bloomberg, Mayor, City of New York, New York

Thank you, Chairman Rangel, and Members of the Committee.

It's time for our country to reduce our dependence on fossil fuels.

Doing so will increase our economic efficiency and competitiveness . . . enhance our national security . . . improve our air quality . . . promote public health . . . and reduce our impact on global climate change.

Many State and local governments are already taking the lead.

In New York City, we've set a goal of reducing our output of greenhouse gases by 30% by the year 2017—even as our population grows to an unprecedented 9 million people.

We're pursuing an aggressive, multi-pronged strategy that stresses both conservation and encouraging the use of alternative fuels.

We're making progress. Today, we're releasing our annual "greenhouse gas inventory" for New York City. It shows that our carbon footprint shrank 2.5% between 2005 and 2007, thanks mainly to milder weather and two new and more efficient power plants.

Our biggest challenges, however—energy consumption and vehicle traffic—continue to grow faster than our population.

That demonstrates why, for State and local efforts to be truly effective, they must be matched at the Federal level.

That must start with national policy that puts a price on carbon emissions.

Set such a price—and the market will reduce emissions, by providing an incentive to use cleaner fuels, and by leveling the playing field for alternative forms of energy.

Pricing carbon emissions could involve levying a carbon tax, as Congressmen Stark and Larson have proposed. This is the approach nearly every economist prefers—as do I.

Or, as others, including Congressman Doggett, have proposed, comprehensive "cap and auction" systems on greenhouse gas emissions could also be effective.

Any such pricing regimen must be based on four essential principles:

First, implementation should be simple and straightforward.

The best place to put a price on carbon emissions that exceed a legislated cap is "upstream," at the points of fossil fuel production, such as coal mines and petroleum refineries.

This would mean assessing a carbon price at hundreds of locations in our Nation, not the many thousands that would have to be monitored if the price were to be imposed further downstream in the process of using fuels.

Second, we should ensure a uniform price on carbon emissions that is uniformly administered.

The government's auction of credits must cover 100% of credits. Sweetheart deals for the well-connected would distort and undercut the process, sowing confusion and mistrust.

Some industries argue that they will be injured. But they are the worst polluters. They have to clean up fastest. Better that than their hiring lobbyists to strike deals that would undermine the whole process.

Ensuring price fairness and predictability will also encourage the investment in alternative energy sources essential to our Nation's future.

Third, carbon pricing must be accompanied by a commitment to revenue neutrality.

It's been estimated that a Federal auction of carbon credits could bring $1.1 trillion into the U.S. Treasury during the first 6 years that such a system would be in place.

If Washington gets to treat this like a revenue piñata, Americans will be justifiably repelled, and the cause of reducing our dependence on fossil fuels will be tragically set back.

So Congress should offset the higher costs that consumers will bear as a result of carbon pricing with rebates on payroll or other personal taxes.

Fourth, and finally, while a "carbon tariff" on nations that don't sign on to a global agreement to reduce their emissions may eventually become necessary, let's lead by example, and not look for excuses to retreat into protectionism.

Members of the Committee: It's very encouraging to see how rapidly the debate on carbon pricing is advancing.

That's evidenced by this hearing about the best way to design such a pricing system.

The devil, as always, remains in the details. But by employing the principles that I've just outlined, I believe we can create a carbon-pricing system that is fair and forward-looking.

Chairman RANGEL. Thank you, Mr. Mayor. Thank you, that you rearranged your schedule and you could stay with us longer. Again, the policy of this Committee is that our witnesses will have 5 minutes to state their views.

You can see the interest that the panel has, and so therefore we expect that Members will also restrict to 5 minutes, that we can get as much in as possible this morning if we can adhere to the 5-minute rule.

Mr. Orszag, Dr. Orszag, who is the Director of the Congressional Budget Office, I think the Congress, Republicans and Democrats, have to thank you for the bipartisan research that you do for us. We don't always follow it, but it's good to know that you are there.

We know that, as we try to resolve this serious issue and fulfill our responsibilities, that we can depend on your office for the research and the backups that we need.

Thank you for being with us. You are recognized for 5 minutes.

STATEMENT OF PETER R. ORSZAG, PH.D., DIRECTOR, CONGRESSIONAL BUDGET OFFICE

Mr. ORSZAG. Thank you, Mr. Rangel, Mr. McCrery. Climate change is one of the world's most pressing long-term problems. Some degree of risk exists for the damage to be large and potentially even catastrophic.

Reducing emissions, however, will impose short-term costs on the economy. The political system is, arguably, not particularly good at dealing with this kind of issue in which there are short-term costs required in order to obtain expected long-term benefits.

Analysis suggests, however, that smart policy design can significantly reduce the costs involved. In particular, what you do with any allowances under a cap and trade program, and whether you provide flexibility, not only in terms of where and how the reductions occur, but when, can matter a lot, in terms of the overall costs of meeting any given climate objective.

First, the value of the allowances created under any cap and trade program would be substantial. CBO estimates that under the Lieberman-Warner bill, the aggregate value would be more than $100 billion in 2012, and would rise thereafter.

The question is what the government does with that $100 billion. Does it give it away, or does it sell the permits and use those funds for some other purpose? Just to be clear, you can't do both at once.

Evidence suggests that the economic cost of a 15-percent reduction in U.S. emissions might be twice as large if policymakers gave the allowances away than if they sold the allowances and used the revenue to reduce distortionary taxes on either labor or capital.

Giving the permits away would also create a windfall profit for shareholders. Despite what proponents sometimes suggest, not prevent—again, not prevent—the price increases that are a necessary part of a cap and trade program, and that would disproportionately affect low-income people.

Indeed, one can think of issuing allowances at no cost to firms as the equivalent of auctioning the permits, and then handing the cash that is raised to the firms themselves. That is the way that CBO is scoring proposals to give away permits, and that is most consistent with underlying economics involved, and I think highlights the windfall profit point.

In other words, when viewed either from a macroeconomic perspective or a distributional one, giving the permits away ranks relatively poorly under either criterion.

A second main way to reduce the economic costs involves timing flexibility. A simple cap and trade program provides flexibility to firms to reduce emissions where and how they are cheapest to do, and that's great.

But it's also important to recognize the disjuncture between the environmental dynamic on climate change and the economic one. From an environmental perspective, what matters is cumulative emissions, not whether you reduce emissions this year or next year.

From an economic perspective, however, the cost of reducing a ton of emissions this year can vary a lot, relative to next year. If you don't take that into account—and a very simple cap and trade system, which imposes an aggregate cap on emissions each year does not—you unnecessarily raise the cost of achieving whatever it is that you want to achieve.

One can build into cap and trade programs provisions that provide this kind of timing flexibility. So, for example, you can build in both a ceiling and a floor on prices. You can build in banking and borrowing provisions. But it is very important to provide that type of flexibility if you want to reduce the costs involved, and also to limit the volatility of the permit prices, which, for example, in the sulfur dioxide program, have been significantly more volatile than stock prices.

Finally, my written testimony discusses the particular challenges that energy-intensive sectors, like the steel and aluminum industries, could face under a cap and trade program. These sectors account for perhaps 15 percent of aggregate U.S. energy consumption, and about 5 percent of GDP, and roughly the same share of employment.

They could lose sales to imports from other countries that do not impose as aggressive climate regimes if we moved ahead with addressing global climate change. That substitution of imports would not only hurt our domestic industries, but also through the so-called carbon leakage, mitigate any environmental benefit.

There are a variety of proposals that have been put forward to try to address these concerns, and my written testimony goes through the pros and cons, along with their consistency, or potential consistency, with our World Trade Organization obligations. Thank you very much, Mr. Chairman.

[The prepared statement of Mr. Orszag follows:]

Congressional Budget Office

Testimony

Statement of
Peter R. Orszag
Director

Issues in Designing a Cap-and-Trade Program for Carbon Dioxide Emissions

before the
Committee on Ways and Means
U.S. House of Representatives

September 18, 2008

This document is embargoed until it is delivered at 10:30 a.m. (EDT) on Thursday, September 18, 2008. The contents may not be published, transmitted, or otherwise communicated by any print, broadcast, or electronic media before that time.

CONGRESSIONAL BUDGET OFFICE
SECOND AND D STREETS, S.W.
WASHINGTON, D.C. 20515

Chairman Rangel, Congressman McCrery, and Members of the Committee, thank you for the invitation to testify this morning on reducing the economic costs involved in addressing climate change. If policymakers adopt a cap-and-trade program to reduce carbon dioxide (CO_2) and other greenhouse gases, the economic costs will depend on several specific design features of the program.

Global climate change is one of the nation's most significant long-term policy challenges. Human activities are producing increasingly large quantities of greenhouse gases, particularly CO_2. The accumulation of those gases in the atmosphere is expected to have potentially serious and costly effects on regional climates throughout the world. Although the magnitude of such damage remains highly uncertain, there is growing recognition that some degree of risk exists for the damage to be large and perhaps even catastrophic.

The risk of potentially catastrophic damage from climate change can justify taking action to reduce that risk in much the same way that the hazards we all face as individuals motivate us to buy insurance. Some of society's resources may best be devoted to addressing climate change even if the most severe damage ultimately does not materialize.

Reducing greenhouse-gas emissions would be beneficial in limiting the degree of risk associated with climate change, especially the risk of significant damage. However, decreasing those emissions would also impose costs on the economy—in the case of CO_2, because much economic activity is based on fossil fuels, which release carbon in the form of that gas when they are burned. Much of those costs will be passed along to consumers in the form of higher prices for energy and energy-intensive goods.

Designing a cap-and-trade program to achieve such reductions would include important decisions about whether to sell or give away allowances. Those rights to emit greenhouse gases would have substantial value, and policymakers' choices about how to allocate them could have significant effects on the federal budget and on how the gains and losses brought about by the program were distributed among U.S. households. If policymakers chose to sell the allowances, they could use the revenue that would arise in many different ways, including to offset other taxes, to assist workers or low-income households that might be adversely affected by the cap, to support other legislative priorities, or to reduce the budget deficit. Policymakers would also need to decide whether to include provisions to help contain the cost of the policy by allowing firms flexibility as to when they reduced their emissions and whether to include provisions to address effects on international trade, particularly for energy-intensive goods. My testimony makes the following key points about those issues:

- A cap-and-trade program could raise significant revenue because the value of the allowances created under the program would probably be substantial. For example, the Congressional Budget Office (CBO) estimated that the value of the allowances under the cap-and-trade proposal that went to the Senate floor in June would be roughly $112 billion once the cap took effect in 2012 and would increase as the cap became more stringent.

- Issuing allowances to entities at no charge, provided that the recipients can readily convert the allowances into cash, is economically equivalent to selling the allowances and dedicating the revenue to those same entities. That equivalency is likely to hold when the allowances can be sold in a large and liquid secondary market, as would be the case under most cap-and-trade programs for greenhouse gases. CBO's estimate of the federal cost of two recent bills considered by the Senate, S. 2191 and S. 3036, reflected that equivalency by recording the value of most of the freely allocated allowances as both revenues and outlays.

- Policymakers' decisions about how to allocate the allowances could have significant effects on the overall economic cost of capping CO_2 emissions and on the distribution of gains and losses among U.S. households. Giving away a large share of the allowances to companies that produce fossil fuels or energy-intensive goods could be more costly to the economy and more regressive than selling them. That approach would preclude using the value of the allowances to create additional incentives for economic activity. It could also create "windfall profits" for shareholders, while not preventing the cap from causing price increases that would disproportionately affect low-income people.

- If the government chose to sell emission allowances, it could use some of the revenue to offset the disproportionate economic burden that higher prices would impose on low-income households. Selling allowances could also significantly lessen the overall economic impact of a CO_2 cap. Evidence suggests that the economic cost of a 15 percent cut in U.S. emissions (not counting any benefits from mitigating climate change) might be more than twice as large if policymakers gave the allowances away than if they sold the allowances and used the revenue to lower current taxes on labor or capital that discourage economic activity, such as income or payroll taxes. Likewise, dedicating the allowance revenue to reduce the federal deficit could lower the overall economic cost.

- Policymakers could help reduce the cost of achieving any given long-term target for reducing emissions if they included provisions in a cap-and-trade program that allowed firms some degree of flexibility about when emission reductions take place. Such provisions would augment the flexibility about where and how emission cuts are made that is intrinsic to a cap-and-trade program. Timing flexibility would allow firms to reduce emissions more when the cost of doing so was low and would provide firms leeway to reduce their efforts when costs were high. One method of providing timing flexibility would be to set a ceiling and a floor for allowance prices. The ceiling would limit firms' expenses when the cost of cutting emissions was high, and the floor would automatically tighten the cap (and thereby increase emission reductions) when the cost of cutting emissions was low. Policymakers could periodically adjust the speed at which the price ceiling and floor increased to ensure that emission reductions were on track for achieving a long-term target.

- Energy-intensive U.S. industries that face foreign competition (for example, the steel and aluminum industries) could lose sales to imports from countries that did not have similarly stringent policies to reduce greenhouse gases. That substitution of imports for U.S. production could reduce the environmental benefits of the policy, because it would result in emission increases from countries with less stringent policies. Some proposals would address those concerns by providing transitional assistance to manufacturers of energy-intensive products in the United States or requiring importers of those products to purchase allowances. Those proposals could, in the short run, protect domestic manufacturers from being disproportionately harmed and limit the loss of intended environmental benefits. Even so, questions remain about whether the proposals could be effectively implemented in a way that would be consistent with U.S. obligations under its agreements with the World Trade Organization.

How a Cap-and-Trade Program Would Work

Under a cap-and-trade program, policymakers would set a limit on total emissions during some period and would require regulated firms to hold rights, or allowances, to the emissions permitted under that cap. (Each allowance would entitle companies to emit one ton of CO_2 or to have one ton of carbon in the fuel that they sold.) After the allowances for a given period were distributed, firms would be free to buy and sell the allowances among themselves. Firms that were able to reduce emissions most cheaply would profit from selling allowances to firms that had relatively high abatement costs. The trading aspect of the program would lead to substantial cost savings relative to command-and-control approaches—which would mandate how much entities could emit or what technologies they should use—because it would provide more flexibility about where and how emission reductions were achieved.

A cap-and-trade program has been implemented at the federal level in the United States to limit emissions of sulfur dioxide (which contribute to acid rain). That program has been in effect since 1995 and is widely perceived to have reduced emissions at a significantly lower cost than would have been the case if lawmakers had chosen to rely on a command-and-control approach. Several states have considered, or adopted, plans for a cap-and-trade program for CO_2 emissions, but none is yet operational. A cap-and-trade program for CO_2 emissions is currently in operation in the European Union as part of its effort to comply with emission limits under the initial phase of the Kyoto Protocol, which spans 2008 to 2012.

The Potential Value and Budgetary Treatment of Allowances

In establishing a cap-and-trade program, policymakers would create a new commodity: the right to emit CO_2. The emission allowances would have substantial value. On the basis of a review of the existing literature and the range of CO_2 policies now being debated, CBO estimated that by 2020, the value of those allowances could total between $50 billion and $300 billion annually (in 2006 dollars). The actual value

would depend on various factors, including the stringency of the cap, the possibility of offsetting CO_2 emissions through carbon sequestration or international trading of allowances, and other features of the specific policy that was selected.[1] On June 2, 2008, CBO estimated that the value of the allowances created under S. 3036 would be roughly $112 billion once the proposed program took effect in 2012; in subsequent years, the aggregate value of the allowances would be even greater.

Policymakers would need to decide how to allocate the allowances that corresponded to each year's CO_2 cap. One option would be to have the government capture their value by selling the allowances, as it does with licenses to use the electromagnetic spectrum. Another possibility would be to give the allowances to energy producers or some energy users at no charge. The European Union has used that second approach in its 2-year-old cap-and-trade program for CO_2 emissions, and nearly all of the allowances issued under the 13-year-old U.S. cap-and-trade program for sulfur dioxide emissions are distributed in that way.

The budgetary treatment of allowances that are auctioned is straightforward: The auctions generate receipts for the federal government, and those amounts are recorded as revenues. In some cases, allowances that are given away by the government should, in CBO's view, also be reflected in the federal budget (recorded both as revenues and outlays). That treatment is appropriate when the allowance recipients would be able to immediately and easily convert the allowances into cash by selling them in a large and liquid secondary market. In such cases, distributing allowances at no charge to specific firms or individuals is, in effect, equivalent to auctioning the allowances and then distributing the auction proceeds to those firms or individuals. Treating allowances issued at no charge as both revenues and outlays reflects the equivalency of those two scenarios. CBO applied that budgetary treatment to most of the allowances freely allocated under S. 2191 and S. 3036. (In contrast, the proceeds associated with the allowances allocated free of charge to producers and importers under smaller, more constrained cap-and-trade programs—such as the cap-and-trade program for hydrofluorocarbons proposed under S. 2191 and S. 3036—should not be recorded in the budget, CBO believes, primarily because the market created for such allowances would be relatively illiquid and, therefore, the allowances would be less like cash.)

The Distributional Consequences of a Cap-and-Trade Program

Whether policymakers decided to sell the allowances or give them away would have significant implications for the distribution of gains and losses among U.S. households. The ultimate distributional impact of a cap-and-trade program would be the

1. Carbon sequestration is the capture and long-term storage of CO_2 emissions underground (geological sequestration) or in vegetation or soil (biological sequestration). For more information, see Congressional Budget Office, *The Potential for Carbon Sequestration in the United States* (September 2007).

net effect of two distinct components: the distribution of the costs of the program (including the cost of paying for the allowances) and the distribution of the allowances' value. Market forces would determine who bore the costs of a cap-and-trade program, but policymakers would determine who received the value of the allowances. The ultimate effect could be either progressive or regressive, imposing disproportionately large burdens on high-income or low-income households, respectively.

Market Forces Would Determine Who Bore the Costs of a Cap

Obtaining allowances—or taking steps to cut emissions to avoid the need for such allowances—would become a cost of doing business for firms that were subject to the CO_2 cap. However, those firms would not ultimately bear most of the costs of the allowances. Instead, they would pass them along to their customers (and their customers' customers) in the form of higher prices. By attaching a cost to CO_2 emissions, a cap-and-trade program would thus lead to price increases for energy and energy-intensive goods and services, the production of which contributes the most to those emissions. Such price increases would stem from the restriction on emissions and would occur regardless of whether the government sold emission allowances or gave them away. Indeed, the price increases would be essential to the success of a cap-and-trade program because they would be the most important mechanism through which businesses and households would be encouraged to make investments and behavioral changes that reduced CO_2 emissions.

The rise in prices for energy and energy-intensive goods and services would impose a larger burden, relative to income, on low-income households than on high-income households. For example, without incorporating any benefits to households from lessening climate change, CBO estimated that the price increases resulting from a 15 percent cut in CO_2 emissions would cost the average household in the lowest one-fifth (quintile) of all households arrayed by income slightly more than 3 percent of its income; such increases would cost the average household in the top quintile just under 2 percent of its income (see Table 1).[2]

The higher prices that would result from a cap on CO_2 emissions would reduce demand for energy and energy-intensive goods and services and thus create losses for some current investors and workers in the sectors of the economy that supply such products. Investors might see the value of their stock decline, and workers could face the risk of unemployment as jobs in those sectors were cut. Stock losses would tend to be widely dispersed among investors, because shareholders typically diversify their portfolios. In contrast, the costs borne by workers would probably be concentrated among relatively few households and, by extension, their communities.

2. Those numbers are based on an analysis that CBO conducted using 1998 data; see Congressional Budget Office, W*ho Gains and Who Pays Under Carbon-Allowance Trading? The Distributional Effects of Alternative Policy Designs* (June 2000). CBO is in the process of updating those figures, using recent data on households' expenditures and income.

Table 1.

Effects on U.S. Households of the Higher Prices Resulting from a 15 Percent Cut in CO_2 Emissions

	Average for Income Quintile				
	Lowest	Second	Middle	Fourth	Highest
Annual Cost Increase in 2006 Dollars	680	880	1,160	1,500	2,180
Annual Cost Increase as a Percentage of Income[a]	3.3	2.9	2.8	2.7	1.7

Source: Congressional Budget Office, *Who Gains and Who Pays Under Carbon-Allowance Trading? The Distributional Effects of Alternative Policy Designs* (June 2000).

Notes: These numbers do not reflect any of the benefits from reducing climate change.

The policy examined here is a cap-and-trade program designed to lower U.S. carbon dioxide (CO_2) emissions by 15 percent from 1998 levels. (CBO performed the analysis in 2000 and used 1998 emission levels so that the distributional effects could be based on actual, rather than projected, data on consumer spending and taxes.) CBO assumed that the full cost of cutting emissions would be passed along to consumers in the form of higher prices and that the price increase for a given product would be proportional to the amount of CO_2 emitted from the fossil fuels used in its production.

These numbers reflect data on each quintile's cash consumption and estimates of cash income. (A quintile contains one-fifth of U.S. households arrayed by income.) Because of data limitations, the numbers should be viewed as illustrative and broadly supportive of the conclusions in this analysis rather than as precise estimates.

a. The cost increases are equivalent to percentage declines in households' after-tax income.

Policymakers Would Determine Who Received the Value of the Allowances

Although the price increases triggered by a cap-and-trade program for CO_2 emissions would be regressive, the program's ultimate distributional effect would depend on policymakers' decisions about how to allocate the allowances. As noted above, those allowances would be worth tens or hundreds of billions of dollars per year. Who received that value would depend on how the allowances were distributed.

Lawmakers could more than offset the price increases experienced by low-income households or the costs imposed on workers in particular industrial sectors by providing for the sale of some or all of the allowances and using the revenue to pay compensation. From analyzing the ultimate distributional effects of a cap-and-trade program that would reduce CO_2 emissions in the United States by 15 percent, CBO concluded that lower-income households could be better off (even without counting any benefits from reducing climate change) as a result of the policy if the government chose to sell the allowances and use the revenue to pay an equal lump-sum rebate to every household in the United States. In that case, the size of the rebate would be larger than the average increase in low-income households' spending on energy and energy-intensive

goods.[3] Such a strategy would increase average income for households in the lowest income quintile by about 2 percent (see the top panel of Figure 1). At the same time, average income for households in the top quintile would fall by less than 1 percent, CBO estimates.

In contrast, if lawmakers chose to use the allowances to decrease corporate income taxes, the effect would be significantly more regressive than the initial price increases. Because low-income households pay relatively little in corporate taxes, the reduction in corporate tax rates would not offset their increased spending on energy and energy-intensive goods. Households in the top income quintile, however, would experience an increase in after-tax income as a result of the policy. Should policymakers decide to use the revenue from selling allowances to decrease payroll taxes, the effect (not shown in the figure) would be regressive as well, although less so than for a cut in corporate taxes.[4]

Giving all or most of the allowances to energy producers to offset the potential losses of investors in those industries—as was done in the cap-and-trade program for sulfur dioxide emissions—would also exacerbate the regressivity of the price increases. On average, the value of the CO_2 allowances that producers would receive would more than compensate them for any decline in profits caused by a drop in demand for energy and energy-intensive goods and services whose production causes emissions. As a result, the companies that received allowances could experience windfall profits.

For example, in 2000, CBO estimated that if emissions were reduced by 15 percent, as in the scenario discussed above, and all of the allowances were distributed free of charge to producers in the oil, natural gas, and coal sectors, the value of the allowances would be 10 times as large as coal, oil, and natural gas producers' combined profits in 1998. Profits for those industries have climbed substantially since then, yet the value of the allowances associated with the policy that CBO analyzed would still be large relative to those producers' profits.[5] Because the additional profits from the allowances' value would not depend on how much a company produced, such profits would be unlikely to prevent the declines in production and resulting job losses that the price increases (and resulting drop in demand) would engender.

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3. One researcher has suggested that an environmental tax credit based on earnings could offer another means of reducing the regressive effects of the price increases that would result from a tax or cap on CO_2 emissions. See Gilbert E. Metcalf, *A Proposal for a U.S. Carbon Tax Swap* (Washington, D.C.: Brookings Institution, October 2007).

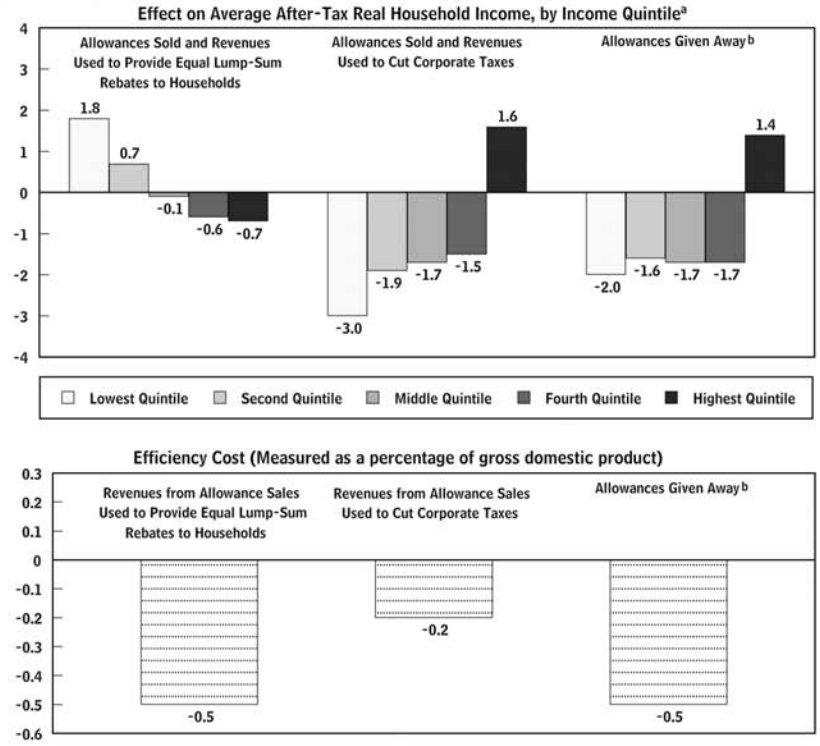
4. For those results, see Congressional Budget Office, *Trade-Offs in Allocating Allowances for CO_2 Emissions* (April 25, 2007).

5. Specifically, CBO estimated that the value in 1998 of the allowances stemming from the 15 percent reduction in U.S. emissions would total $155 billion (in 2006 dollars). By comparison, profits for U.S. producers of oil, natural gas, and coal totaled $13.5 billion in 1998 (in 2006 dollars). Those companies' total profits have grown substantially—for example, in 2006, they totaled $174 billion.

Figure 1.

Effects of a 15 Percent Cut in CO_2 Emissions, with the Allowances' Value Used in Various Ways

(Percentage change)



Sources: Congressional Budget Office (top panel); Terry M. Dinan and Diane Lim Rogers (bottom panel), "Distributional Effects of Carbon Allowance Trading: How Government Decisions Determine Winners and Losers," *National Tax Journal*, vol. 55, no. 2 (June 2002).

Notes: These figures do not reflect any of the benefits from reducing climate change.

The policy examined here is a cap-and-trade program designed to reduce carbon dioxide (CO_2) emissions by 15 percent from 1998 levels. (CBO performed the analysis in 2000 and used 1998 emission levels so the distributional effects could be based on actual, rather than projected, data on consumer spending and taxes.) In the top panel, the costs of the cap-and-trade policy are shown as decreases in real household income, measured as a percentage of after-tax income before the policy change. Those numbers reflect data on each quintile's cash consumption and estimates of cash income. (A quintile contains one-fifth of U.S. households arrayed by income.) Because of data limitations, those numbers should be viewed as illustrative and broadly supportive of the conclusions in this analysis rather than as precise estimates.

a. Indicates the net effect of households' increased expenditures because of cap-induced price increases and the income that households would receive as a result of the allowance-allocation strategy.

b. These estimates assume that the government would use any positive net revenue remaining after accounting for ways in which the policy affected the federal budget to provide equal lump-sum rebates to households. The results would be more regressive if the government used any positive net revenue to decrease corporate taxes or payroll taxes.

In addition, those profits would accrue to shareholders, who are primarily from higher-income households, and would more than offset those households' increased spending on energy and energy-intensive goods and services. Low-income households, by contrast, would benefit little if allowances were given to energy producers for free, and they would still bear a disproportionate burden from the price increases that would nonetheless occur. Thus, giving away allowances would be significantly regressive, making higher-income households better off as a result of the cap-and-trade policy while making lower-income households worse off.

Reducing the Overall Economic Impact of a CO_2 Cap

Restricting CO_2 emissions would impose costs on the economy. Lawmakers could help minimize those costs by using the allowances' value in ways that would benefit the economy and by allowing firms some degree of flexibility about when emission reductions must be made.

Using the Allowance Value to Reduce the Total Economic Cost

The ways in which lawmakers allocate the revenue from selling emission allowances would affect not only the distributional consequences of a cap-and-trade policy but also its total economic cost. For instance, the government could use the revenue from auctioning allowances to reduce existing taxes that tend to dampen economic activity—primarily, taxes on labor, capital, or personal income. As research indicates, a CO_2 cap would exacerbate the economic effects of such taxes: The higher prices caused by the cap would lower real (inflation-adjusted) wages and real returns on capital, which would be equivalent to raising marginal tax rates on those sources of income. Using the value of the allowances to reduce such taxes could help mitigate that adverse effect of the cap. Alternatively, policymakers could choose to use the revenue from auctioning allowances to reduce the federal deficit. If that reduction lessened the need for future tax increases, the end result could be similar to dedicating the revenue to cuts in existing taxes.

The decision about whether or not to sell the allowances and use the proceeds in ways that would benefit the economy could have a significant impact. For example, researchers have estimated that the efficiency cost (discussed below) of a 15 percent cut in emissions could be reduced by more than half if the government sold the allowances and used the revenue to lower corporate income taxes, rather than devoting the revenue to providing lump-sum rebates to households or giving the allowances away (see the bottom panel of Figure 1). The efficiency cost of a policy reflects the economic losses that occur because prices in the economy are distorted in that they do not reflect the (nonenvironmental) resources used in their production. That cost includes decreases in the productive use of labor and capital as well as costs (both monetary and nonmonetary) associated with reducing emissions. To provide perspective on the magnitude of such efficiency costs, they are depicted as a share of gross domestic product.

Allowing Flexibility in the Timing of Emission Reductions to Lower Costs

In its most inflexible form, a cap-and-trade program would require that a specified cap on emissions was met each year. That lack of flexibility would increase the cost of achieving any long-term goal because it would prevent firms from responding to year-to-year differences in conditions that affected costs for reducing emissions, such as fluctuations in economic activity, energy markets, the weather (for example, an exceptionally cold winter would increase the demand for energy and make meeting a cap more expensive), and the technologies available for reducing emissions.

In contrast, the key issue from an environmental perspective involves the emissions and concentrations of greenhouse gases over the long term, not the year-to-year fluctuations in emissions. In other words, limiting global climate change will entail substantially reducing the amount of greenhouse gases that accumulate in the atmosphere over the next several decades, but the benefits of doing so are largely independent of the annual pattern of those reductions.[6] Consequently, a cap-and-trade program could achieve roughly the same level of benefits at a significantly lower cost if it provided firms with an incentive to make greater reductions in emissions at times when the cost of doing so was low and allow them leeway to lessen their efforts when the cost was high.

Including features in a cap-and-trade program that enabled firms to reduce emissions less when the cost was high and more when the cost was low could also reduce the volatility of allowance prices. Experience with cap-and-trade programs has shown that price volatility can be significant. For example, one researcher found that the price of sulfur dioxide allowances under the U.S. Acid Rain Program was significantly more volatile than stock prices between 1995 and 2006 (see Figure 2).[7]

Price volatility could be particularly problematic with CO_2 allowances because fossil fuels play such an important role in the U.S. economy. In 2006, fossil fuels accounted for 85 percent of the energy consumed in the United States. CO_2 allowance prices could affect energy prices, inflation rates, and the value of imports and exports. If those prices were volatile, they could have disruptive effects on markets for energy and energy-intensive goods and services and could make investment planning difficult.

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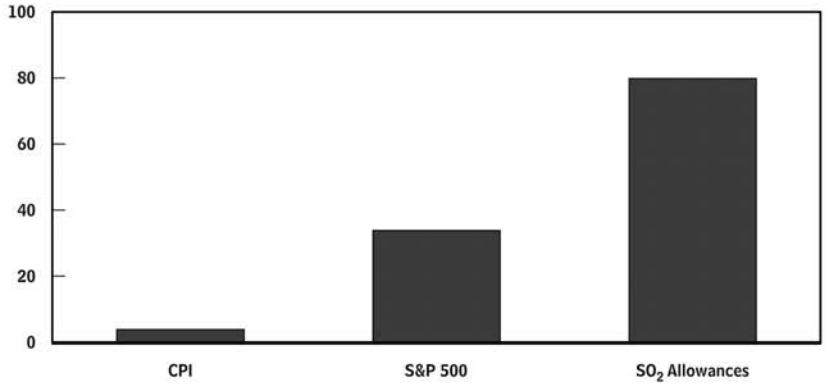
6. Although costs and benefits are difficult to measure, the long-term cumulative nature of climate change implies that the *benefit* of emitting one less ton of CO_2 in a given year—referred to as the marginal benefit—is roughly constant. In other words, the benefit in terms of averted climate damage from each additional ton of emissions reduced is roughly the same as the benefit from the previous ton of emissions reduced, and shifting the reductions from one year to another does not materially affect the ultimate impact on the climate. In contrast, the *cost* of emitting one less ton of CO_2 in a given year—the marginal cost—tends to increase with successive emission reductions. The reason is that the least expensive reductions are made first and progressively more-expensive cuts would then have to be made to meet increasingly ambitious targets for emission reductions.

7. See William D. Nordhaus, "To Tax or Not to Tax: Alternative Approaches to Slowing Global Warming," *Review of Environmental Economics and Policy,* vol. 1, no. 1 (Winter 2007), pp. 37–39.

Figure 2.

Volatility of SO_2 Allowance Prices and Selected Other Prices, 1995 to 2006

(Average annual percentage rate of volatility)



Source: Congressional Budget Office based on William D. Nordhaus, "To Tax or Not to Tax: Alternative Approaches to Slowing Global Warming," *Review of Environmental Economics and Policy,* vol. 1, no. 1 (Winter 2007), pp. 26–44.

Note: Volatility is calculated as the annualized absolute logarithmic month-to-month change in the consumer price index (CPI), the stock price index for the Standard & Poor's 500 (S&P 500), and the price of sulfur dioxide (SO_2) allowances under the U.S. Acid Rain Program.

Design Features Providing Flexibility in the Timing of Emission Reductions

Recent proposals for cap-and-trade proposals include a variety of design features that would provide firms or regulators with flexibility in the timing of emission reductions, thereby reducing the economic costs of limiting greenhouse-gas emissions.

A Price Ceiling and a Price Floor. A combined price ceiling and price floor offers one method of allowing timing flexibility and thereby reducing the economic burden of achieving any desired target for cumulative emissions:

- Setting a ceiling, or safety valve, for the price of allowances could prevent the cost of reducing emissions from exceeding either the best available estimate of the environmental benefits or the cost that policymakers considered acceptable. The government could maintain a price ceiling by selling companies as many allowances as they would like to buy at the safety-valve price.

- Similarly, policymakers could prevent the price of allowances from falling too low by setting a price floor. If the government chose to auction a significant share of the allowances, it could specify a so-called reserve price and withhold allowances from the auction as needed to maintain that price. The efficiency advantage of a price floor would stem from the fact that it could prevent the cost of emission reductions from falling below the expected benefits or below the level of effort that policymakers intended.

A cap-and-trade program that included both a ceiling and a floor for allowance prices could achieve a long-term target for emissions while minimizing both the overall cost of achieving the target and price volatility. Under such a program, policymakers would specify annual emission targets as well as a ceiling and a floor for the price of allowances for each year. Regulators could adjust the levels of the price ceiling and floor periodically (for example, every five years) to ensure that emission reductions were on track for achieving the long-run target. For example, the rate at which the price floor or ceiling rose over time could be increased if regulators determined that the reductions in the previous five-year period were significantly lower than the amount needed to achieve the long-term target. Alternatively, policymakers could include provisions in a cap-and-trade program that would automatically trigger adjustments in the price ceiling and floor. For example, the rate at which the price ceiling and floor rose could be based on the percentage gap between anticipated and actual emissions in the previous five-year period.

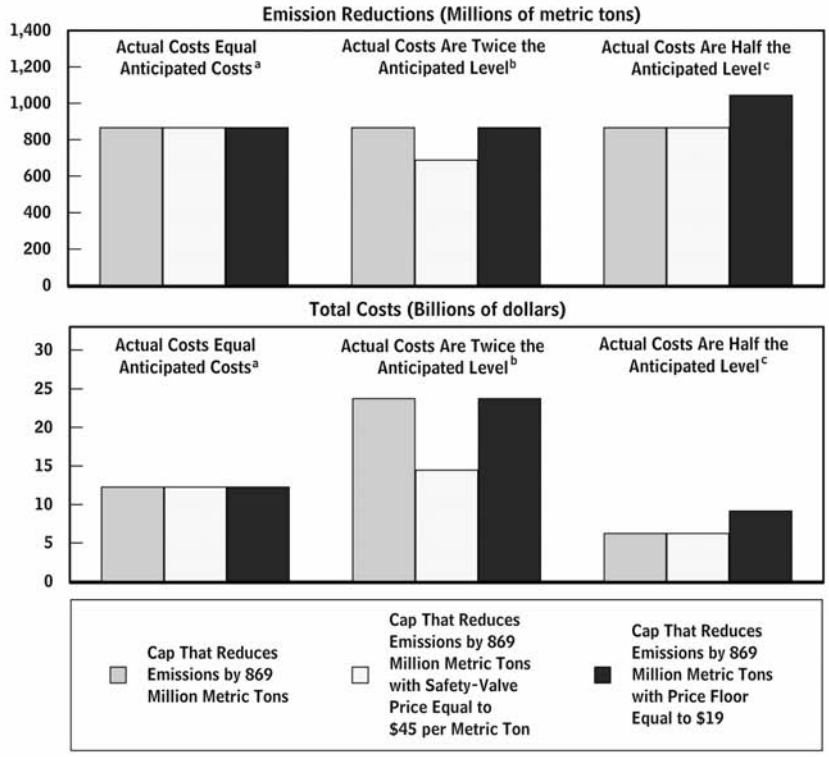
Figures 3 and 4 illustrate the effects of price ceilings and floors. The figures present a simple example of an inflexible cap each year relative to a system involving price ceilings and floors. In Figure 3, the results illustrate what happens if the cost of reducing emissions by 15 percent is twice as high or 50 percent lower than expected in any given year. Under an inflexible cap, the emission reductions are unaffected. Under a price ceiling, fewer emission reductions are undertaken when the cost is high; the result is lower economic costs that year but also less of a reduction in emissions. Under a price floor, more emission reductions are undertaken when the cost is low.

Figure 4 shows the results after one high-cost year and one low-cost year. Cumulative emission reductions are the same under the inflexible cap and the combined price ceiling and floor, but costs are substantially lower under the latter approach. The reason, again, is that more of the emission reductions are undertaken in the low-cost year under that approach.

Borrowing and Banking Allowances. An alternative but generally somewhat less effective approach to reducing economic costs involves allowing companies to borrow future allowances in high-cost years, thereby deferring emission reductions to later years. Borrowing allowances from future years would tend to reduce allowance prices in the current year but then raise prices in the future (because borrowing would allow smaller reductions now but require greater reductions later). Firms would want to borrow allowances only if they expected the price of allowances in the future to be sufficiently below the current price as to make deferring reductions profitable. Most proposals would impose limits on borrowing, furthermore, in part because of concerns about enforcement and questions about who would be liable if the firm that

Figure 3.

Illustrative Comparison of Various Cap-and-Trade Policies to Reduce CO_2 Emissions by Roughly 15 Percent Under Different Cost Conditions in 2018



Source: Congressional Budget Office.

Notes: This example examines the emission reductions and total costs that would result in 2018, assuming that the policy covered only the United States. The cost of firms' emission reductions is derived from Mark Lasky, *The Economic Costs of Reducing Emissions of Greenhouse Gases: A Survey of Economic Models,* Congressional Budget Office Technical Paper No. 2003-03 (May 2003).

A safety valve is a ceiling on the price of emission allowances.

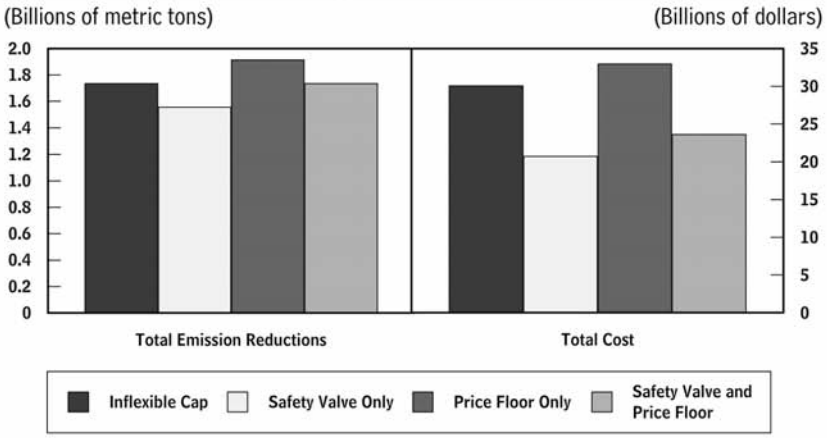
a. Assumes that the actual marginal cost of reducing emissions by 869 million metric tons is $30 per metric ton, the cost that policymakers anticipated when they set the cap.

b. Assumes that the actual marginal cost of reducing emissions by 869 million tons is $60 per metric ton but that the safety valve induces less reductions (691 million tons instead of 869 million), up to a marginal cost of $45 per metric ton.

c. Assumes that the actual marginal cost of reducing emissions by 869 million tons is $15 per metric ton but that the price floor induces more reductions (1,047 million tons instead of 869 million) at a marginal cost of $19 per metric ton.

Figure 4.

Illustrative Comparison of Total Emission Reductions and Total Costs After One High-Cost and One Low-Cost Year



Source: Congressional Budget Office.

Notes: This example represents the cumulative emission reductions and costs over two years of a cap-and-trade policy that would reduce emissions of carbon dioxide by 869 million tons in each year (roughly a 15 percent reduction in 2018). The cost of firms' emission reductions is derived from Mark Lasky, *The Economic Costs of Reducing Emissions of Greenhouse Gases: A Survey of Economic Models*, Congressional Budget Office Technical Paper No. 2003-03 (May 2003).

A safety valve is a ceiling on the price of emission allowances.

For the high-cost year, CBO assumes that the marginal cost of reducing emissions by 869 million tons is $60 per metric ton but that the safety valve induces less reductions (691 million tons instead of 869 million), up to a marginal cost of $45 per metric ton.

For the low-cost year, CBO assumes that the marginal cost of reducing emissions by 869 million tons is $15 per metric ton but that the price floor induces more reductions (1,047 million tons instead of 869 million) at a marginal cost of $19 per metric ton.

borrowed future allowances was unable to pay them back (if it declared bankruptcy, for example).

Similarly, policymakers could help keep the price of allowances from falling too low by allowing companies to exceed their required emission reductions in low-cost years in order to bank allowances for use in future high-cost years. The additional emission reductions motivated by banking in low-cost years would put upward pressure on the price of allowances in those years.

Aggregate Borrowing by Regulators. S. 2191 and S. 3036 would have addressed sustained high prices for allowances by allowing an administrative board, the Carbon Market Efficiency Board, to transfer future allowances to the current year. That approach could be viewed as a form of forced borrowing—that is, it would require firms to trade higher reductions in the future and, hence, higher prices for future allowances for lower reductions and lower prices today, even if they would not have voluntarily made this trade across time. Such transfers could ultimately raise or lower the overall cost of meeting a long-run target depending on how the price of allowances changed over time. For example, if an inexpensive low-carbon energy technology became available in the future, transferring future allowances to the current period would have successfully shifted emission reductions to a time when the cost of achieving them was lower. Alternatively, if policymakers borrowed future allowances with the expectation that such a technology would become available, but it did not, then the transfer could cause even more reductions to be made at a relatively high-cost time.

An alternative approach to the one embodied in those bills, which may be easier for regulators to implement efficiently, would be to adopt a system providing a combined price ceiling and price floor and to have the board be responsible for setting the ceiling and floor prices and for adjusting those price limits periodically as needed to achieve a long-term target.

Design Features Addressing Energy-Intensive Manufacturing Industries

Several bills introduced during the 110th Congress contain provisions that pertain to certain energy-intensive manufacturing industries that are subject to foreign competition. The proposals potentially address the concern that if a cap-and-trade system was adopted in the United States, manufacturing in certain industries could shift to countries with less stringent climate policies, which would undermine the environmental goals that the domestic policy was intended to achieve and harm U.S. manufacturers.

During 2006, about 30 percent of total U.S. greenhouse-gas emissions came from domestic manufacturing industries, either directly through the manufacturing process or indirectly through the use of electricity in manufacturing.[8] Some of those industries—such as those producing chemicals, glass, cement, iron and steel, aluminum, food, and paper and pulp, which accounted for about 15 percent of U.S. energy consumption—face significant foreign competition.

Reducing greenhouse-gas emissions would raise production costs for energy-intensive manufacturers by increasing the prices of the energy that they purchase or by causing them to invest in equipment to reduce their emissions. As a result, their sales, employment, and profits would probably decline, at least in the short run. Over the longer

8. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sink: 1990–2006* (2008).

term, changes in investment and in the mix of output produced in the United States would mitigate those effects.

Unlike companies that face only limited foreign competition, such as electric utilities, manufacturers might have difficulty passing increased costs on to consumers because they face competitors in both the U.S. and international markets. If foreign competitors (either foreign-owned or subsidiaries of U.S. firms) did not experience similar increases in production costs because of less stringent emission standards abroad, U.S. output and employment in those industries would probably decline. Moreover, the environmental benefits of reducing U.S. emissions might be partially offset by increased emissions elsewhere, an effect known as "carbon leakage."

Several recent bills—including S. 1766, S. 3036, H.R. 6186, and H.R. 6316 (see Table 2)—have included two design features that are intended to cushion the economic impacts on energy-intensive manufacturing industries and to protect against carbon leakage: border adjustments and transitional assistance.

Border Adjustments. Recent bills have included provisions that, in effect, would require importers of certain goods from countries without climate policies to obtain allowances from an international reserve on the basis of the carbon emissions embodied in those goods. Such border adjustments would increase the cost of imports, raise their price in the U.S. market, and thus level the playing field for affected U.S. producers. In S. 1766 and S. 3036, the basis for calculating the number of reserve allowances required for imports was the extent to which carbon emissions in a given sector for a given country increased following the introduction of a climate policy in the United States. In more recent proposals, such as H.R. 6186 and H.R. 6316, the allowance requirement is based on the total emissions from a given sector in a given country. Some of the bills also would take into account the economic development status of the exporting country and the extent to which it had undertaken efforts to reduce greenhouse-gas emissions. In addition, many of the bills recently proposed would reduce the allowance requirement by the degree to which transitional assistance was given to domestic manufacturing.

By increasing the price of imports, border adjustments would limit any increase in CO_2 emissions from having unregulated imports displace goods produced in the United States. The requirements would give exporting countries the same incentive to reduce emissions in the production of their exports to the United States that the cap-and-trade program would give to U.S. producers.

Adjustments to exports are also possible but have not been included in recent proposals. Policymakers could provide allowances for free to U.S manufacturers to cover the emissions associated with the goods that they export. Such adjustments would lower compliance costs for U.S. exporters and could help mitigate any losses in U.S. exports that might otherwise occur as a result of a climate policy. When U.S. exports are already less carbon-intensive than foreign competitors' goods, export adjustments would serve to guard against carbon leakage in international markets.

Table 2.

Comparison of Border Adjustments and Transitional Assistance in Recent Bills

Bill Number	Applicability[a]	Effective Dates	Basis for Import Allowance Requirement	Adjustments to Import Allowances	Allowance Allocation for Transitional Assistance[b]
S. 1766	Primary Products	2020–2050	Increase over Baseline in a Covered Good's Embodied Carbon Emissions	Based on Transitional Assistance and Economic Development of Exporting Country	10% of Allowances Allocated to Energy-Intensive Manufacturing in 2012 and Phased out by 2043
S. 3036	Primary Products	2020–2050	Increase over Baseline in a Covered Good's Embodied Carbon Emissions	Based on Transitional Assistance and Economic Development of Exporting Country	10% of Allowances Allocated to Energy-Intensive Manufacturing in 2012 and Phased out by 2030
H.R. 6186	"Trade-Exposed" Primary Goods (Other than fuel)	2020–2050	A Covered Good's Embodied Carbon Emissions	Based on Economic Development of Exporting Country	6% of Allowances Allocated to Energy-Intensive Manufacturing from 2012 to 2019
H.R. 6316	Primary Products and Manufactured Items for Consumption	2015–2050	A Covered Good's Embodied Carbon Emissions	Based on Transitional Assistance, Degree of Comparable Effort, and Economic Development of Exporting Country	10% of Allowances Allocated to Energy-Intensive Manufacturing in 2012 and Phased out by 2019

Source: Legislative Information System (LIS), available at www.congress.gov/index.php (last accessed September 4, 2008).

a. A "covered good" is a primary product (or a manufactured item for consumption in the case of H.R. 6316) that generates, in the course of its manufacture, a substantial quantity of direct or indirect greenhouse-gas emissions and whose cost of production in the United States would be affected by the nation's climate policy; a "primary product" is defined as iron, steel, aluminum, or other manufactured product that is sold in bulk for the purpose of further manufacture (see H.R. 6316, sec. 101); a "manufactured item for consumption" is defined as a good that is not a primary product but that generates a substantial amount of direct or indirect emissions attributable to the primary product(s) in the manufactured item.

b. "Transitional assistance" refers to allocations of domestic allowances free of charge (it can be linked to production decisions about such items as output or labor).

When U.S. exports are more carbon-intensive than foreign competitors' goods, export adjustments could undermine the benefits from meeting a domestic cap on greenhouse gases. Export adjustments would also eliminate the incentive to reduce greenhouse-gas emissions from the manufacture of goods for export, making it more expensive to achieve a domestic cap.

The scope of coverage differs among the bills. They all cover energy-intensive primary goods (for example chemicals, glass products, cement products, iron and steel products, aluminum products, food products, and paper and pulp products), and some include various energy-intensive finished goods, such as vehicles. The wider the scope, the more difficult it becomes to calculate the number of reserve allowances required. Regulators would find it particularly challenging to estimate the carbon emissions embodied in finished goods, especially when inputs might come from different countries using different technologies.

Another challenge is that the national origin of goods exported to the United States could be difficult to determine, particularly if willful schemes using importing and reexporting were used to obscure the origin of components produced in nations without a sanctioned climate policy. The larger the scope of covered goods (and the greater the difference in border adjustments by countries with comparable climate policies), the greater the likelihood of such schemes.

Transitional Assistance. Recent proposals would provide transitional assistance to energy-intensive manufacturers by giving allowances to firms in certain industries: 10 percent of the allowances beginning in 2012 under S. 1766, S. 3036, and H.R. 6316, and 6 percent of the allowances beginning in 2012 under H.R. 6186. Recent proposals would phase out transitional assistance more quickly than earlier proposals—H.R. 6186 and H.R. 6316 would cease allocations to energy-intensive manufacturing in 2019.

Giving allowances to energy-intensive manufacturers for free would not, in general, change their responses to a climate policy unless the grants were explicitly tied to specific production decisions. S. 1766, S. 3036, and H.R. 6316 would tie the amount of allowances allocated to an individual firm to the number of employees in that company relative to the sector average—providing an incentive to increase production or to substitute labor for capital or energy. H.R. 6186 would tie the allocation of transitional assistance to the output of an individual firm relative to the average output in the sector, thus providing an incentive for increased production. In those cases, transitional assistance in the short run could help energy-intensive manufacturers maintain their output and thereby limit the loss of U.S. jobs. Over the longer term, regardless of how the allowances were allocated, many of the affected sectors would probably be able to offset higher energy costs by substituting fuels containing less carbon and adopting technological advances.[9]

9. See Morgenstern and others, *Competitiveness Impacts of Carbon Dioxide Pricing Policies on Manufacturing*, Resources for the Future, Climate Policy Forum, Issue Brief 7 (November 2007).

Compatibility with WTO Agreements. Adopting border adjustments would raise questions about whether using them to reduce carbon leakage would be compatible with U.S. obligations under the various World Trade Organization (WTO) agreements. Border adjustments might be challenged by other member countries of WTO. Even if such border adjustments were eventually found to be legal, many years could pass before rulings by WTO dispute settlement panels and the WTO Appellate Body (in cases challenging not only the U.S. program but other countries' programs as well) made clear precisely what was and what was not allowed. Only a cursory survey of the issues is possible here.

Each member country has agreed to upper limits, known as tariff bindings, beyond which it is not allowed to raise its tariffs. Almost all U.S. tariffs are at or near their limits, so border adjustments or other charges on imports under a cap-and-trade policy would be illegal under the WTO agreements unless covered by one of the exceptions contained in the agreements. Recent analyses point to two exceptions that the United States might use as defenses in any challenge to a border adjustment system.[10]

First, Articles II and III from the General Agreement on Tariffs and Trade (GATT—one of the WTO agreements) allow the imposition of taxes on imports that are equivalent to internal taxes imposed on like domestic goods. Several issues would arise in such a defense, not the least of which is whether two otherwise identical goods were "like" within the meaning of the WTO agreement and jurisprudence if the amount of CO_2 emitted in their production was different. In the past, determinations of "like" goods have generally not considered the processes used to produce them. Moreover, the border adjustments on imports would have to adhere to the most-favored-nation requirements of the agreement, which require that imports from all countries be treated the same. That requirement might mean that the border adjustments could not be reduced for imports from countries taking measures to reduce CO_2 emissions.

The second exception that the United States might use as a defense in a challenge is described in GATT Article XX. Paragraph (g) of that article allows for border measures "relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consump-

10. Joost Pauwelyn, *U.S. Federal Climate Policy and Competitiveness Concerns: The Limits and Options of International Trade Law*, Working Paper NI WP 07-02 (Duke University, Nicholas Institute for Environmental Policy Solutions, April 2007); Jason E. Bordoff, "International Trade Law and the Economics of Climate Policy: Evaluating the Legality and Effectiveness of Proposals to Address Competitiveness and Leakage Concerns" (paper presented at the Brookings Institution's conference on Climate Change, Trade, and Competitiveness, Washington, D.C., June 9, 2008); Gary Clyde Hufbauer, Jisun Kim, and Steve Charnovitz, *Reconciling GHG Limits with the Global Trading System* (draft, Peterson Institute for International Economics, Washington, D.C., August 2008); Robert Howse and Antonia Eliason, "Domestic and International Strategies to Address Climate Change: An Overview of the WTO Legal Issues," in Bigdeli, Cottier, and Nartova, eds., *International Trade Regulation and the Mitigation of Climate Change* (Cambridge University Press, forthcoming); and Andrew Green, "Climate Change, Regulatory Policy and the WTO: How Constraining Are Trade Rules?" *Journal of International Economic Law*, vol. 8, no. 1 (2005).

tion." A number of issues would arise in a defense based on that article as well. For example, past cases suggest that a dispute settlement panel would insist that there be a "sufficient nexus" between CO_2 emissions in the country challenging the tax and the consequences for the climate in the United States. If carbon leakage would be relatively small without a border adjustment (as some studies indicate would be the case), a dispute panel might conclude that the real reason for the border adjustment was not the prevention of carbon leakage but the protection of U.S. industry, which is not a valid justification under Article XX. The introduction to the article also requires that the "measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade." That phrase might be interpreted to require that border adjustments be reduced for imports from countries making efforts of their own to reduce emissions or for some developing countries.

Last, detailed sector or firm-level data on embodied carbon emissions could be needed to develop border adjustments because the WTO requires that producers from different countries be treated the same. Border adjustments based on sector averages have been found to be noncompliant in earlier WTO disputes.[11] If some or all of the allowances in the domestic cap-and-trade program were given away rather than sold, still other issues could arise. For example, they might be considered an actionable subsidy under the Subsidies and Countervailing Measures Agreement if a similar proportion of the permits required for imports were not given away.

11. See, for example, Appellate Body, United States—Standards for Reformulated and Conventional Gasoline, WT/DS2/AB/R (April 29, 1996).

Chairman RANGEL. Thank you, Doctor. Dr. Carol Browner is no stranger to this Committee or to the Congress, having been the longest serving EPA Director, and one who has concentrated not only on the improvement of the environment, which she considered a moral obligation for the United States to participate in, but also the economic impact of it. So, we know that we can depend on your support far beyond the 5 minutes that you are sharing with us this morning. Thank you, and welcome back.

STATEMENT OF THE HONORABLE CAROL M. BROWNER, PRINCIPAL, THE ALBRIGHT GROUP LLC

Ms. BROWNER. Thank you, Mr. Chairman. It is, indeed, a pleasure to be here today. Let me start by congratulating this Committee on taking an interest in the issue of climate change. I think for those of us who have worked on this issue for the better part of the last two decades, we certainly welcome the engagement of this Committee. I applaud Congressman Doggett for his bill and his leadership on this matter.

Addressing climate change presents not just challenges, but tremendous opportunities, opportunities to rethink our energy future, and to move forward on energy independence. Taking action now will allow us to avoid the worst climate impacts, and can drive the creation of a clean energy economy, in which we exchange carbon dependency for greater energy independence and new clean energy jobs.

Not only should we consider the cost of any actions we take, we should also consider the cost of inactions. Study after study have shown that those costs could be very high.

There is a recent University of Maryland study looking at the impacts of climate change on eight States. The research shows that climate change could cost our States billions of dollars by mid-century. The study finds that in the Midwest, for example, agricultural losses alone may total $10 billion or more per year.

According to another study, if emissions are left unchecked, heat-related deaths in southern California could increase up to sevenfold; annual rainfall in the West could decrease by 15 percent; and along the Gulf coast, sea level rise could lead to increased hurricane damages in Louisiana, Florida, and Texas.

I have long believed that comprehensive cap and trade auction legislation is the best way to reduce greenhouse gas emissions. During my tenure at EPA, we established the acid rain cap and trade program, in which businesses buy and sell sulphur dioxide allowances that have been granted by the government.

There are two things you should know about this program, in addition to the fact that it reduced our SO_2 emissions. First, it has had the highest rate of compliance of any program to reduce pollution in the history of EPA. Secondly, the cost of achieving those reductions have been dramatically lower than the original estimates. The cost of compliance have been only 30 percent of what EPA originally estimated the cost would be to industry.

Now, for cap and trade legislation to be successful, I think there are a couple of things to be mindful of. For the business community—and the mayor spoke to this—we need predictability and flexibility. They need to know what is expected of them. What are

the targets? They need to be clear and concise. What are the timeframes over which those targets must be met?

The business community also needs some flexibility. We have heard from CBO some ideas. Another idea to consider is banking and borrowing. Let the businesses work across a couple of years to determine when they can most cost effectively achieve the reductions we are asking them to make.

Finally, the government needs to work efficiently. Each agency and department must function as it was designed to do. That means Treasury can do what Treasury does well, and EPA should do what EPA does well. The traditional work of EPA encompasses standard setting and program implementation. The work of the Treasury Department includes revenue, collection, and allocation. I believe that each of these agencies should be tasked appropriately to do what they do best, and to bring those shared experiences to bear so that we can create an effective program.

You know, time and time again, when we have set environmental standards, there have been naysayers. There have been those who have said, "We can't do it." But you know what? If we look back over the history of 30 years of environmental commitment in this country, what we find is each time we do set a standard, we rise to the challenge and we find the ingenuity, the innovation, and a more cost effective way of achieving that goal, of reducing our pollution and allowing our families and our communities to be healthy.

I want to close by making one note—noting one thing for the Committee. I do believe that Congress has to take the leadership on this issue. But you should be mindful of the fact that last year the Supreme Court found that EPA, under the existing Clean Air Act, can, in fact, regulate carbons. So, there is authority there. The magnitude of this is such that I think Congress should act, but I think it is important to remember there is some existing authority.

Again, Mr. Chairman, thank you for the opportunity, and thank you for your interest in this matter.

[The prepared statement of Ms. Browner follows:]

Prepared Statement of The Honorable Carol Browner, Principal, The Albright Group LLC

Thank you, Mr. Chairman and Members of the Committee, for inviting me today to speak about one of the greatest environmental, social, and economic challenges our country has ever faced—climate change.

Let me first congratulate the Committee for its engagement on this issue. All of us who have been active on the challenge of climate change welcome the involvement of the Ways and Means Committee in shaping U.S. climate legislation.

Climate change presents our Nation with a number of great challenges, but also a tremendous opportunity. In responding to the climate crisis, the United States has the opportunity to rethink our energy future and move toward energy independence. Taking action now will allow us to avoid the worst climate impacts and will drive the creation of a clean energy economy, in which we exchange carbon-dependency for greater energy independence and new clean energy jobs.

This transition requires government leadership. And it is in our best interests to act now—both economically and environmentally. At all levels, the costs of action must be weighed against the great costs of inaction. The University of Maryland recently published a study on the costs of climate impacts in eight States. The research shows that climate change could cost our States billions by mid-century. The study finds that in the Midwest, for example, agricultural losses alone may total $10 billion per year or more.

According to another study, heat-related deaths in southern California could increase up to sevenfold if emissions go unchecked. Annual rainfall in the West could decrease by 15 percent. And along the Gulf Coast, sea level rise could lead to increased hurricane damages in Louisiana, Florida, and Texas.

I believe that comprehensive cap and trade legislation is the best way to reduce greenhouse gas emissions. By bringing to bear market mechanisms, we can address the climate crisis in a cost effective and efficient manner.

For legislation to be successful, we need a couple of things. For the business community, predictability and flexibility are paramount. That means a predictable market signal, indicating what reductions are required and over what time frame. Flexibility could include the option to bank and borrow allowances, so that individual companies can meet their requirements at the lowest cost possible.

And for our government to work efficiently, each agency and department must function as it was designed to do—that means Treasury doing what Treasury does best, and EPA doing what EPA does best. The traditional work of EPA encompasses standard setting and program implementation. The traditional work of the Treasury Department includes revenue collection and allocation. EPA and Treasury should be tasked, respectively, with these elements of the climate program. In a cap and trade system, EPA can set the standards and ensure compliance, and Treasury can manage the revenues from allowance auctions.

Even conservative estimates of the revenue that would be generated from the auctions are in the billions—revenue that can be used to offset costs to American families and to invest in a new generation of clean energy technologies.

Time and time again, when the Nation has set a new environmental standard, the nay-sayers have warned that it will cost too much; that it will impose an enormous economic burden on the American people. But, once we have set those standards, American ingenuity and innovation have found a solution at a far lower cost than predicted. This is because once there is a standard, there is a guaranteed market for new technologies, so that businesses are prepared to invest in innovation. When Congress banned CFCs, which were damaging our atmosphere, many said the ban would mean the end of air conditioning in our cars and homes. One company saw a guaranteed market for an alternative and took advantage of the opportunity, which reaped them a nice return. American businesses have risen to these challenges before, and they will do it again; all they need is predictability and flexibility.

During my tenure at EPA, we established the acid rain program, in which businesses trade sulfur dioxide allowances that have been granted by the government. This program has the highest rate of compliance of any EPA pollution control program, and at a far lower cost than predicted. For the acid rain program, the costs of compliance have been only 30% of what EPA originally estimated.

Let me close by reminding the Committee that following the Supreme Court's *Massachusetts v. EPA* decision in 2007, EPA has the authority to regulate greenhouse gases under the 1990 Clean Air Act. If EPA does not act, it is likely that the Agency will be sued and forced to act. Given the magnitude of the problem, and the scale of the solution required, I believe it is important that Congress provide national leadership on this issue.

Thank you very much. I will be happy to take your questions.

Chairman RANGEL. Thank you, Doctor. We look forward to working with you when we settle down to get this thing done.

We are fortunate enough to have Dr. Dallas Burtraw: author, researcher, lecturer, and one who has gained an international reputation and expertise in the quality in climate control. Thank you for sharing your views with us, and you are recognized at this time for 5 minutes.

STATEMENT OF DALLAS BURTRAW, PH.D., SENIOR FELLOW, RESOURCES FOR THE FUTURE

Mr. BURTRAW. Thank you, Mr. Chairman, for the opportunity to testify today. I am a senior fellow at Resources for the Future, and RFF neither lobbies nor takes positions on specific proposals. The views I present today are my own.

My research leads me to find that the most important aspect in designing a cap and trade program is the initial assignment of the market value of the allowances. This is even more important to the long-run success of climate policy than the initial level of the cap.

The carbon dioxide cap and trade program would constitute the greatest creation of government-enforced property rights since the 19th century. Depending on the stringency of the cap and breadth of the program, it will introduce into the economy property rights ranging from $100 billion to $370 billion every year, in the form of tradable emissions allowances.

There is no inherent claim to the property value created under this program. Policymakers might frame the decision about allocating emission allowances this way.

Imagine you are implementing a new program that will create well over $1 trillion in value in the next decade. Now, how do you want to allocate that value? The decision has both efficiency and distributional consequences, which brings me to my first point: the award of free CO_2 emission allowances is equivalent to a grant of cash, as we have heard before, this morning.

As such, it does not affect the production decision of plant managers. A corollary idea is that, in a competitive market, how the emission allowances are initially distributed does not affect the price of goods and services in the economy.

By analogy, if you were buying a house, it would not occur to you that its price might depend on whether its previous owner had bought or inherited the house. Similarly, the managers of firms should be expected to realize the maximum possible value for allowances that might be received for free. Otherwise, they would have some explaining to do to their shareholders.

The allocation of emissions allowances is likely to involve a familiar tradeoff between efficiency and distributional outcomes. However, that is not true in considering free allocation to shareholders of incumbent firms. Free allocation does not perform well on efficiency or distributional grounds. Free allocation would not offer the efficiency advantages of reducing pre-existing taxes. It is decidedly a regressive policy, because the value of the free allowances accrues primarily to higher-income households, and creates the possibility of windfall profits.

Also, free allocation directs about 10 percent of the allowance value overseas to foreign owners of shareholder equity, and that value is not available to any income group in the United States.

Using the allowance value, instead, to reduce the income tax or the payroll tax has great appeal to me, as an economist, because of the efficiency advantages of lowering taxes on labor. Unfortunately, our research indicates this efficiency advantage may come out of distributional costs, as lower-income households would receive less of the benefit of tax reduction, and would bear a relatively larger burden.

In contrast, too modestly progressive policies would be expansion of the earned income tax credit or a cap and dividend approach that would return revenue directly to households. The dividend approach would also increase taxable income, yielding revenue that would approximately offset the increases in costs for government under cap and trade. So, budget neutral, in other words.

Assigning a portion of allowance value as investment efficiency is also modestly progressive. It would reinforce program goals, and lessen the impact of climate policy. However, this approach is problematic, because the institutions and policies that would be used to achieve this outcome are not well specified.

In my written comments I address special issues in the electricity sector, and other important elements of cap and trade, including cost management and the protection for domestic firms against unfair international competition.

I want to close by emphasizing that the true crucial elements of good design for cap and trade are transparency and simplicity, because these attributes reduce risk and inspire investor confidence. Climate change is inherently complicated, and an uncertain challenge. Climate policy must strive to be the opposite, if the voting public is going to embrace a national commitment to address the problem.

Complicated formulas create the perception, deserved or not, of favoritism and game rigging that is likely to erode public support. Simple tax reform, or even simpler still, direct dividends to households, are approaches that would provide the most convincing signals to the public that we are addressing climate change as a common national initiative.

We should recognize at the outset that an important part of climate policy may be the need to go back to the American public in the future for further commitments. When it comes to the design of cap and trade, a transparent and simple approach is the strongest principle one can cling to for good market design, and to make sure the American public understands the policy, and understands the national effort to try to solve this problem.

Thank you for the opportunity to testify.

[The prepared statement of Mr. Burtraw follows:]

Written Testimony of Dallas Burtraw

Senior Fellow, Resources for the Future, Washington, D.C.

Prepared for the U.S. House of Representatives
Committee on Ways and Means

Preventing Climate Change: Second in a Series of Hearings

September 18, 2008
1100 Longworth House Office Building

Summary of Testimony

These comments highlight three important features in the design of a cap-and-trade policy to regulate greenhouse gas emissions in the United States including the initial distribution of allowance value created under the program, management of costs and the protection of domestic industry from unfair international competition.

Written Testimony of Dallas Burtraw

Preventing Climate Change: Second in a Series of Hearings

Mr. Chairman, thank you for the opportunity to testify before the House Committee on Ways and Means. My name is **Dallas Burtraw,** and I am a senior fellow at Resources for the Future (RFF), a 55-year-old research institution based in Washington, D.C., that focuses on energy, environmental, and natural resource issues. RFF is independent and nonpartisan, and shares the results of its economic and policy analyses with environmental and business advocates, academics, government agencies and legislative staff, members of the press, and interested citizens. RFF neither lobbies nor takes positions on specific legislative or regulatory proposals. I emphasize that the views I present today are my own.

For several years, I have studied the performance of emissions cap-and-trade programs from both scholarly and practical perspectives. I have evaluated the sulfur dioxide (SO2) emissions allowance trading program created by the 1990 Clean Air Act Amendments, the nitrogen oxide (NOx) trading program in the northeastern United States, and the European Union Emission Trading Scheme (EU ETS). I have conducted analysis and modeling to support the northeastern states in the design of the Regional Greenhouse Gas Initiative (RGGI). Recently I worked as part of a research team developing recommendations for the design of an auction under RGGI, on behalf of the New York State Energy Research and Development Authority.[1] In another collaborative effort, I worked to provide guidance for the State of Maryland as it implements its plan to join RGGI.[2] Last year, I served on

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[1] Holt, C., Shobe, W., Burtraw, D., Palmer, K., and Goeree, J. 2007. *Auction Design for Selling Co2 Emission Allowances under the Regional Greenhouse Gas Initiative*. October 29. RFF Report.

Burtraw, D., Goeree J., Holt, C., Myers, E., Palmer, K., Shobe, W. 2008. "Collusion in Multi-Unit Auctions: An Experimental Analysis," Resources for the Future Discussion Paper (forthcoming).

[2] Center for Integrative Environmental Research, University of Maryland. January 2007. *Economic and Energy Impacts from Maryland's Potential Participation in the Regional Greenhouse Gas Initiative.*

California's Market Advisory Board overseeing implementation of Assembly Bill 32, the centerpiece of the state's greenhouse gas initiative.[3] Recently we have conducted modeling to provide additional guidance for the implementation of that policy.[4]

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My comments highlight the most important features in the design of a cap-and-trade policy to regulate greenhouse gas emissions in the United States. A carbon dioxide (CO_2) cap-and-trade program would constitute the greatest creation of government-enforced property rights since the 19th century. Depending on the stringency of the cap and breadth of the program, the annual market value of these property rights will range from $100 billion to $370 billion. To be specific, the allocation of allowances involves the distribution into the economy of this much property value every year. The means by which these rights are organized and initially distributed is of historic significance for the economy as well as the environment. Policymakers might frame the decision about allocating emissions allowances in the following way: Imagine we are implementing a new program that will create well over a trillion dollars in value in the next decade. Now, how do you want to allocate that value?

While the level of the emissions cap is the most visible decision facing policymakers, the most important aspect of the policy's design is the initial assignment of the market value of the allowances. This decision affects both the efficiency and distributional consequences of the program. If allocation is not treated carefully, it could undermine the efficiency virtues of cap-and-trade, or lead to unexpected distributional outcomes.

Emitting CO_2 into the atmosphere is an inherent part of economic activity, but in the absence of a market, the economic value of that activity is not apparent to

[3] *Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California*. 2007. Recommendations of the Market Advisory Committee to the California Air Resources Board. (June 30).

[4] Palmer, K., Burtraw, D., Paul, A., 2008. "Compliance Responsibility and Allowance Allocation in a CO_2 Emissions Cap-and-Trade Program for the Electricity Sector in California." (Draft report: July).

investors. The government commitment to enforce the limited property rights associated with emissions allowances is the precondition that sustains a market price. This role for government in a cap-and-trade program is analogous to the establishment of property rights in the great American west because the land did not have a well-identified market value until the government committed to the enforcement of property rights.

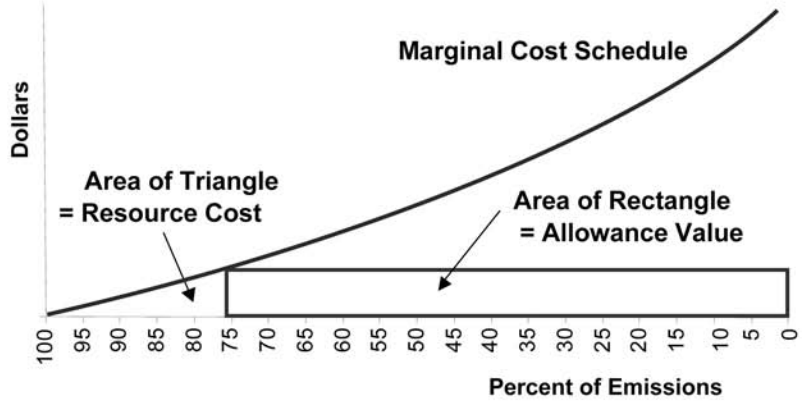


Figure 1. Resource Cost and Allowance Value in a CO_2 Cap-and-Trade Program

For the next couple of decades at least, the value of emissions allowances under a cap-and-trade program should be substantially larger than the value of the resources actually used to achieve emissions reductions. Figure 1 illustrates the mechanism of a placing a price on CO_2 emissions through the introduction of a cap-and-trade policy. The horizontal axis in the graph is the reduction in emissions (moving to the right implies lower emissions), and the upward sloping curve is the incremental resource cost of a schedule of measures to reduce emissions; thus it sketches out the marginal abatement cost curve. The hypothetical emissions cap in the figure is set at about 75 percent of baseline emissions. The graph illustrates how

the allowance value rectangle—the height of the rectangle equals the allowance price and the width is the number of emissions allowances—is much larger than the triangle-shaped abatement costs. Moreover, the value of the allowances (the rectangle) grows faster than the cost of emissions reductions (the triangle) as the emissions cap is tightened until reductions of about one-third are reached. These facts highlight the important role played by the allocation of emissions allowances in determining the regressivity of climate policy under an incentive-based policy such as cap-and-trade or a carbon tax.

The substantial size of the program will create costs that could cause severe distributional consequences, depending on how the value of the allowances is distributed in the economy. Nonetheless, a cap-and-trade approach has the advantage of being able to identify the lowest cost emissions reductions. There is tremendous variation in the cost of emissions reductions among agents in the economy, and indeed among nations, and cap-and-trade regulation is expected to yield emissions reductions where they are least expensive, leading to a much lower overall compliance cost than traditional pollution control measures. In addition, cap and trade establishes a price that provides a financial signal to agents in the economy about the resource costs of goods and services, just as do prices of other goods. In each case, these signals help ensure that resources are allocated to their highest valued use.

This brings me to my first point. <u>The award of free CO_2 emissions allowances is equivalent to a grant of cash.</u> The allocation of allowances does not affect the production decisions of plant managers. If a cap-and-trade approach works as intended, emission allowances will be used where they are most valuable and emission reductions will occur where they are the least expensive. Where these activities occur does not depend on whether emissions allowances are distributed for free or not.

By analogy, consider the decision of a firm that owns a production facility such as an aluminum smelter and also owns a nearby hydroelectric facility

originally built to provide power for that smelter. If electricity prices on the grid rise substantially, the opportunity cost of aluminum manufacturing increases because the firm could sell the hydroelectric power onto the grid and reduce production at the smelter. The fact that the smelter owns the power plant does not change the price it is willing to pay for electricity. We have seen many examples of firms making this decision as smelters, pulp and paper facilities, etc. reduce their economic activity despite being adjacent to power-generating facilities originally built to provide them with reliable power.

A corollary idea is that in a competitive market how the emissions allowances are initially distributed does not affect the price of goods and services in the economy. This follows if the allowance market is sufficiently liquid that allowances flow to their highest value use (just as electricity flows to its highest value- use). The firm will charge its customers for the use of allowances as an input to production just as it will charge for fuel or labor used for its production activities, whether it has paid for the allowances in the market or in an auction or received the allowances for free. By analogy, if you were buying a house, it would not occur to you to think that its price might depend on whether its previous owner had bought or inherited the house – you would expect the owner to charge what the market will bear. The managers of firms should be expected to do the same in order to realize the maximum possible value for allowances that might be received for free. Otherwise, they would have some explaining to do – to their shareholders!

One exception to this proposition is the electricity sector, because in much of the nation it does not behave as a conventional competitive market. Instead, many states employ cost-of-service regulation, giving regulators the responsibility to see that prices are set so as to recover justly incurred costs. If allowances are distributed through an auction, firms in regulated regions could expect to have retail prices adjust in order to protect shareholder value. Conversely, if allowances were received at no cost in regulated regions, then electricity prices in those regions would not change as much and electricity consumers would see lower electricity prices (and consume more electricity) than under an auction.

One dilemma that surfaces with free allocation to the electricity sector is that it would have an asymmetric outcome, leading to substantially higher changes in electricity prices in some regions of the country, depending primarily on their regulatory status, not on the emissions associated with electricity generation and consumption. Under free allocation, the price change would be larger in competitive regions because firms in a competitive market will charge their customers the market value of emissions allowances used in production even if they have received these allowances for free.

One might offer a policy justification for free allocations of allowances because government often plays a role in compensating entities that are severely harmed by a policy. The electricity sector might be considered a deserving candidate because it is currently responsible for 40 percent of our CO_2 emissions, but on the other hand, it is expected to provide two-thirds to three-quarters of the emissions reductions that would be achieved during the first couple decades of a cap-and-trade program.

Detailed simulation modeling indicates that in competitive regions under an auction, to keep the electricity sector whole – that is, to maintain the market value of companies currently in operation - it would be sufficient to freely allocate just 11 percent of the allowances that would be used in those regions. (This is equal to just 6 percent of the allowances used nationally in the electricity sector.[5]) The free allocation does not have an effect on the retail price paid by consumers; it just reduces the costs to the firms compared to an auction. Unfortunately, even if compensation to the shareholders of these companies is desirable, we find that the

[5] D. Burtraw and K. Palmer, 2008. "Compensation Rules for Climate Policy in the Electricity Sector," *Journal of Policy Analysis and Management,* 27 (4):819-847. This estimate is consistent with those derived from more aggregated general equilibrium analysis. See: Bovenberg, A.L., and Goulder, L.H. 2001. "Neutralizing the Adverse Industry Impacts of CO2 Abatement policies: What Does it Cost?" In C. Carraro and G. Metcalf (eds.), *Behavioral and Distributional Effects of Environmental Policy*. Chicago: University of Chicago Press; and Smith, A.E., Ross, M.T., and Montgomery, W.D. 2002. "Implications of Trading Implementation Design for Equity-Efficiency Trade-Offs in Carbon Permit Allocations." Washington, DC: Charles River Associates.

precise policy or institution that could be used to deliver this compensation is very problematic because it is difficult to separate the firms that lose from those that gain under the policy. To compensate the losers would, in practice, require a much larger share of allowance value, the difference going to other firms as undeserved compensation.

In sum, free allocation creates the possibility for so-called windfall profits, which simply means that the change in firms' revenues is greater than their change in costs. Our research leads us to conclude that policymakers may want to substantially limit free allocation to shareholders because it would lead to the creation of windfall profits without changing the retail price for electricity customers and it comes at the expense of directing allowance value away from other potential purposes.

In Europe, the realization that free allocation resulted in windfall profits has been the most controversial aspect of the design of the EU Emissions Trading Scheme (ETS). It has led to investigations in several countries and is the area where we can draw the most valuable lesson. Our modeling and that of the Energy Information Administration reaffirms the experience in Europe that customers bear most of the cost of climate policy. Customers bear eight times the cost of climate policy in the electricity sector compared to the cost that falls on firms, which pass on most of their costs through changes in retail prices.

As a potential remedy to both the prospect of asymmetric changes in retail prices and to the possibility of windfall profits, some observers including the National Association of Regulatory Utility Commissioners have advocated free allocation to local distribution companies (LDCs) that sell electricity to retail customers. LDCs are universally regulated, even though they may participate in a competitive wholesale power market. Consequently they could act as trustees on behalf of consumers and apply the value of allowances that they receive to offset the change in prices in the wholesale power market. In this case, free allocation would

not affect the wholesale price of electricity; the allowance value would function as a subsidy by electricity consumers to offset the change in the retail price.

Unfortunately, this approach introduces a new dilemma because in this case the change in retail price in the electricity would be lower than would be expected in other sectors of the economy, and therefore spur more electricity consumption and consequently more emissions in the electricity sector. Achieving the allowance cap would require a higher allowance price and greater emissions reductions in other sectors. Our research indicates the allowance price would have to rise by almost 15 percent if the emissions were to achieve the Lieberman-Warner target.[6]

The subsidy to offset allowance costs associated with electricity consumption leads to a violation of the "law of one price" that is necessary to achieve economic efficiency. As with the allocation of any scarce resource, efficiency requires that one price consistently reflects the scarcity value of emission allowances. A lower electricity price means that electricity consumers would have less incentive to purchase energy-efficient air conditioners and refrigerators. In practical terms, if you drive a car, or use natural gas to heat your home or run your industrial facility, you might be concerned that a subsidy to electricity consumers comes at the cost of higher prices for other uses of energy.

In sum, the idea of softening any sudden change in electricity prices is compelling but it has an efficiency cost. One may acknowledge that in the short run consumers have an existing capital stock of refrigerators and air conditioners, and they are constrained in their ability to reduce energy use. To achieve emissions reductions, it is important to establish the expectation that future prices will rise to reflect the scarcity value of CO_2 emissions because this would provide an incentive for consumers to purchase new appliances, etc. The imposition of sudden price changes may be disruptive to the economy and perceived as unfair. However, if

[6] A. Paul, D. Burtraw and K. Palmer. 2008. "Free Allocation to Electricity Consumers Under a U.S. CO_2 Emissions Cap," Resources for the Future Discussion Paper 08-25.

legislation goes down this road, from the standpoint of efficiency it is important to acknowledge that allocation to LDCs should be phased out as soon as possible.

Finally, there is a serious additional challenge. The actual metric for determining how to apportion allowances among LDCs is problematic and that decision — whether to base apportionment to LDCs on the basis of their population, consumption, or the emissions embodied in their consumption — will itself imply big regional swings in the expected change in electricity price.

Drawing away from the special case of the electricity sector to look at the general challenge, policymakers might frame the decision about allocating emission allowances in a general way. There is no inherent right to the property value created under the program; certainly it is impossible to distinguish whether the incumbent users of the atmosphere are firms that operate emitting facilities, firms that might have chosen to employ lower-emitting technologies instead, or consumers of goods that have embodied emissions.

The decision about allocating emissions allowances involves a familiar trade-off between efficiency and distributional outcomes. Federal climate policy would impose potentially significant costs on households that would vary depending on the policy enacted. Taken just by itself, the introduction of a price on CO_2 would be regressive, meaning that it would disproportionately affect lower-income households because they spend a larger portion of their income on energy expenditures. But this is just one-half of the equation. The ultimate impact of the policy would also depend on how the policy distributes the value from the CO_2 price – both the value of emissions allowances, if allocated for free, and the government revenue collected under an allowance auction.

We have examined several options for the initial distribution of allowance value that serve as bookends for the choices policy makers face.[7] Some policies

[7] D. Burtraw, R. Sweeney and M. Walls, 2008. "The Incidence of U.S. Climate Policy: Where You Stand Depends on Where You Sit," Resources for the Future Discussion Paper 08-28.

would convert the regressive nature of the CO_2 price into one that is modestly progressive. These include expansion of the Earned Income Tax Credit and a cap-and-dividend program that would return revenue directly to households.[8]

One aspect of many of the policies we consider is that they lead to an increase in taxable income, which indirectly yields revenue for government. For example, if we assume a dividend of 100 percent of the allowance value back to households would result in about 22 percent of that value coming back to federal and state government.[9] This is important because government will have increased costs under climate policy associated with increased fuel costs, increased obligations associated with indexed entitlement programs, and potentially a decline in other tax revenues. The Congressional Budget Office has estimated these costs could be roughly equal to 23 percent of the total allowance value. In addition, it appears likely that a component of climate policy will include new expenditures associated with investments in new technologies and energy efficiency and helping communities to adapt to a changing climate.

Another policy that is modestly progressive would be investing in efficiency. Some portion of auction revenue could be used to help reinforce program goals and lessen the impact of climate policy. For example, the Model Rule for the 10 northeastern states participating in RGGI specifies that each state must allocate at least 25 percent of its budgeted allowances to a consumer benefit or strategic energy purpose account. (In practice, these states are auctioning off about 90 percent of the emissions allowances.) These "consumer benefit" allowances are to be sold or otherwise distributed to promote energy efficiency, to directly mitigate electricity ratepayer impacts, or to promote lower-carbon-emitting energy technologies. Such a policy is one of the most progressive we examined and would lead to lower allowance prices, indicating less cost would be imposed on other sectors. However, the implementation of this kind of policy is the most problematic

[8] To implement these in a way that reaches households in all income groups would rely on the use electronic benefit transfer, as has been suggested by the Center for Budget and Policy Priorities.

[9] This assumes the recent tax cuts expire in 2010.

of any that we considered because the institutions and policies that would be used have not been identified.

In contrast, three other policies we examined appear severely regressive, even more so than when we just consider the CO_2 price and do not account for the revenue. Two of these involve reducing the income tax or the payroll tax. As an economist, I second many of my colleagues who have pointed out that the use of revenues to reduce preexisting taxes would have important efficiency advantages and would lower the overall cost of the policy. Unfortunately, our results suggest this efficiency advantage may come at a distributional cost as lower-income households would receive less of the benefit of tax reduction and would bear a relatively large burden in these scenarios.

The other severely regressive policy would be free allocation of emissions allowances to the shareholders of emitting facilities (grandfathering) and we find it offers no trade offs; it is costly from an efficiency standpoint and has negative distributional consequences as well. Free distribution to shareholders would not offer the efficiency advantages of reducing preexisting taxes. Furthermore, free allocation directs about 10 percent of the allowance value overseas to foreign owners of shareholder equity and therefore not available to any income group in the United States. Additionally, because the value of the free allowances accrues primarily to higher-income households, this option is decidedly regressive.

Other policies pose the converse trade-off by achieving distributional equity at the expense of efficiency. Exclusion of personal transportation or home heating fuels from the CO_2 cap would lead to higher allowance prices because greater emissions reductions would have to be achieved in other sectors. This has a similar effect as if allowances were used to compensate electricity consumers through free allocation to LDCs, as discussed previously. On aggregate, at the national level, all three of these options are less progressive than simply returning allowance value to households as a dividend.

While the case for equity across income groups is straightforward, interregional equity is more complicated due to differences in preexisting policies, energy prices, resources, and lifestyle choices. Nonetheless, important differences emerge, and the biggest regional differences affect poor households. Households in the lowest two deciles in various regions could incur a substantial welfare *loss* or a substantial welfare *gain* depending on how revenues are distributed. Low-income households in the Northeast, Ohio Valley, and Florida are consistently among the most harmed. Although climate change is a long-run problem, it has an important short-run political dynamic. The local and regional effects of a policy may be fundamentally important to building the political coalition necessary to enact climate policy.

Two Other Important Elements of a Cap-and-Trade Program. I want to briefly touch on two other elements of policy design that can contribute to lowering the cost for the American economy and to protecting households and businesses from unnecessary disruptions. One is to manage the cost of the policy. The opportunity to bank emissions allowances for use in the future is the single most important piece of cost management. With the unfortunate exception of phase 1 of the EU ETS, all previous emissions trading programs that have allowed banking have respected the value of banked emissions when the program has been modified, an important principle for a CO_2 cap-and-trade program. Banking provides an incentive for early action, which expedites the diffusion of new technologies and smoothes the change in costs over time for industry and the economy.

Another cost management tool would be a symmetric safety valve.[10] Plenty of words have been spilled about a price ceiling for an emissions market, but there is only now recognition of the virtue of a complementary price floor. The price floor provides an assurance for innovators and investors that there is a minimum expected value to their efforts. A price floor is naturally achieved as a reserve price

[10] D. Burtraw, K. Palmer and D. Kahn, 2007. "Dynamic Adjustments to Incentive Regulation to Improve Efficiency and Performance." Resources for the Future. Unpublished manuscript.

in an auction for allowances. If the reserve price were not met, a given lot of allowances would not be sold, which would serve to constrain supply.

A reserve price in an auction also is considered to be an important feature of good auction design. Whether thinking about a price cap or a price floor, in order for the market to function in a liquid way and provide price signals to decisionmakers and policymakers, the price cap or floor should be expected to be achieved only occasionally if at all. A price cap that is achieved consistently undermines the expectation that emission targets will be achieved.

Another element of good design is to pay attention to measures that protect domestic firms from unfair competition from foreign firms that may not be subject to environmental regulation. Three general approaches have been suggested to meet this challenge including a border adjustment tax, emission performance standards applied to all imported goods, and free allocation of emission allowances to the domestic firms subject to unfair competition.

The policy that makes the most sense is free allocation of emissions allowances to the affected firms, but this cannot be the same type of one-time decision that characterizes the free allocation of SO_2 emissions allowances under Title IV of the 1990 Clean Air Act Amendments. Instead, it requires free allocation to be conditional on an annual finding by a federal agency of unfair competition for a specific industrial activity in export or import markets. The methodology for such a finding would need to be developed, but my colleagues at RFF have conducted substantial work analyzing this issue. We have found that both the number of firms and the share of GDP that is affected are very small, and the remedy would require only a small sliver of total allowance value. The amount of free allocation would be based on updated data every year about the value added (primarily labor input) in the affected entities.[11] If a facility were to reduce its activity, it would realize a commensurate reduction in its free allocation. Furthermore, that allocation would

[11] This approach, in effect, offers an output subsidy that has some unfortunate consequences, which is why one would not want to apply this approach in general.

be tied not to historic emissions rates but to an identified best practice in the industry. The firm would have to pay for any emissions above this level, thereby retaining an incentive to reduce its own emissions intensity.

In conclusion, the formation of an emissions allowance market for CO_2 is different from the experience with SO_2 allowances because it would create a new asset of enormous value. How that value is distributed in the economy will be very important to the long-term political will to address climate change. Even if the benefits of climate policy outweigh the costs in the long run, the decision about how to initially distribute emissions allowances could have much bigger economic effects on many households in the near term than will the environmental consequences of a changing climate.

Elements of good market design are transparency and simplicity because these attributes reduce risk and invoke confidence in investors. Climate change is an inherently complicated and uncertain challenge; climate policy must strive to be the opposite if the voting public is going to embrace a national commitment to address the problem. These principles apply not just to monitoring and enforcement, but also to the allocation of allowances. Complicated formulas create the perception, deserved or not, of favoritism and game rigging that are likely to erode public support.

Simple tax reform, or even simpler still direct, dividends to households, are approaches that would provide the most convincing signals to the public that we are addressing climate change as a national initiative, one that is not engineered to squirrel away special privileges. We should recognize at the outset that an important part of climate policy may be the need to go back to the American public for further commitments in the future. A transparent and simple approach is the strongest principle one can cling to in making sure the American public understands the policy and understands the national effort to try to solve this problem.

Thank you for the opportunity to testify today.

Dr. Burtraw is a Senior Fellow at Resources for the Future. He holds a Ph.D. in economics and a master's in public policy from the University of Michigan. Dr. Burtraw has conducted research interest in the design of incentive-based environmental policies in the electricity industry and has written extensively on the performance of emissions trading programs in the United States for sulfur dioxide and nitrogen oxides and the European Union's Emission Trading System for carbon dioxide. He also has advised on the design of climate policy for U.S. state governments. He currently serves on the EPA Advisory Council on Clean Air Compliance Analysis and on the National Academies of Science Board on Environmental Studies and Toxicology.

Chairman RANGEL. Let me thank you for your contribution. I just want all of you to know that the Chairman feels awkward that we are restricting you to 5 minutes after all of the work that you have done, not only in preparing the testimony, but all of the knowledge that you have that we really need in order to make positive decisions.

So, do not be surprised if we don't call upon you in a very informal way to come and sit around a table to see how we can work out the obstacles that are in front of us.

But I want to thank you, Doctor.

Our next witness, Robert Lighthizer, is an expert in trade and trade policy. Indeed, he has served as a Deputy Trade Representative, a U.S. Trade Representative. So, as an expert and as an ambassador, we welcome your contribution. You are recognized for 5 minutes.

STATEMENT OF ROBERT E. LIGHTHIZER, PARTNER AND HEAD OF THE INTERNATIONAL TRADE DEPARTMENT, SKADDEN, ARPS, SLATE, MEAGHER & FLOM LLP

Mr. LIGHTHIZER. Thank you very much, Mr. Chairman. It's a pleasure to be here today. I would like to briefly address a topic that, in my view, is absolutely central to your consideration of climate change legislation. Namely, the potential impact on U.S. companies that face significant foreign competition, and the steps that Congress might take to address those competitiveness concerns.

It is not my intent to comment on the wisdom of pursuing cap and trade programs or other mechanisms that would impose new mandatory costs on U.S. producers. The question obviously presents significant issues for Congress and for this Committee. My remarks are confined to the competitiveness challenges that would be presented to American workers and companies if new costs and burdens are imposed.

There should be no mistake. If this issue is not dealt with effectively, it will cause grave and perhaps irreversible harm to American manufacturers. Equally important, failure in this regard will, in all likelihood, undermine the environmental consequences of climate legislation.

The globally competitive industries adding new costs to American products will simply lead to the substitution of imports from countries with lesser environmental requirements. Taking steel as an example, estimates suggest that production in places like China and India may be anywhere from two to four times CO_2 intensive than U.S. production. It is not hard to see how disparate climate costs could not only wipe out American industries, but could seriously worsen the global climate problem at the same time.

I would like to make three core points. First, there are strong arguments that, in enacting climate legislation, the United States can, consistent with WTO rules, place the same requirements on imports that are placed on domestic production. This is not an area of clear precedent. It is always hard to predict what the WTO appellate body will do, particularly given some of the very troubling decisions we have seen from that body.

But it is my view the better argument is that neutral and equal application of regulatory requirements to imports would be permis-

sible. Hopefully, this can be done in conjunction with a negotiated international agreement that will clarify rules and ensure consistent treatment for traded products.

Second, you should avail yourself of this argument so that, consistent with international rules, we can apply any new climate burden to imports. We cannot simply ignore this issue, and hope for an international agreement down the road, because there may be very little left of our basic manufacturing at that time.

Indeed, if Congress concludes that it cannot address the competitiveness issue in climate legislation, either for WTO reasons or otherwise, it should rethink the entire approach we are taking to climate challenge.

Third, while critical, we should recognize that placing equal requirements on imports only addresses part of the problem. It does not do anything about exports, or maintaining our competitiveness in foreign markets. For that reason, proposals that avoid the imposition of new costs on industries that face strong global competition—for example, by granting sufficient free allowances under a cap and trade system—might be optimal and would, at the same time, address both import and export sides of the equation.

To the extent new costs or burdens are placed on domestic production, however, it is critical that imports face the same requirements, to ensure that we remain competitive in our own market.

In conclusion, the competitiveness issue is not an ancillary topic, but goes to the very core of the climate debate. There is, in my view, sufficient flexibility in the global system and rules to allow Congress to meaningfully address this concern. But it will require careful thought and work to craft a proposal that both meets WTO requirements, and is actually effective in leveling the playing field. Both of these are essential objectives.

Obviously, Congress will want to fashion an approach that stands the best chance to satisfy the WTO. But I would caution that simply putting in place a fig leaf that purports to address the competitiveness challenge, but in fact would not create a truly fair playing field, would be the worst option. It would hang our workers and companies out to dry, and ultimately lead to greater, not fewer, greenhouse gas emissions. Thank you, Mr. Chairman.

[The prepared statement of Mr. Lighthizer follows:]

Prepared Statement of Mr. Robert E. Lighthizer,
Partner and Head of the International Trade Department,
Skadden, Arps, Slate, Meagher & Flom LLP [1]

I. INTRODUCTION

I am pleased to testify regarding the relationship between climate change legislation currently under consideration by Congress and U.S. obligations under the Uruguay Round Agreements that established the World Trade Organization ("WTO").

I would like to say at the outset that I do not intend to comment in general on the wisdom of pursuing a cap and trade program or other mechanisms that would impose new, mandatory costs on U.S. producers.[2] There are obviously very significant issues in this regard that will require consideration by Congress and this Committee. My remarks are confined to addressing some of the competitiveness chal-

[1] Mr. Lighthizer is an attorney who leads the International Trade Department of Skadden, Arps, Slate, Meagher, and Flom LLP. The views expressed here are his own and not necessarily those of his firm.

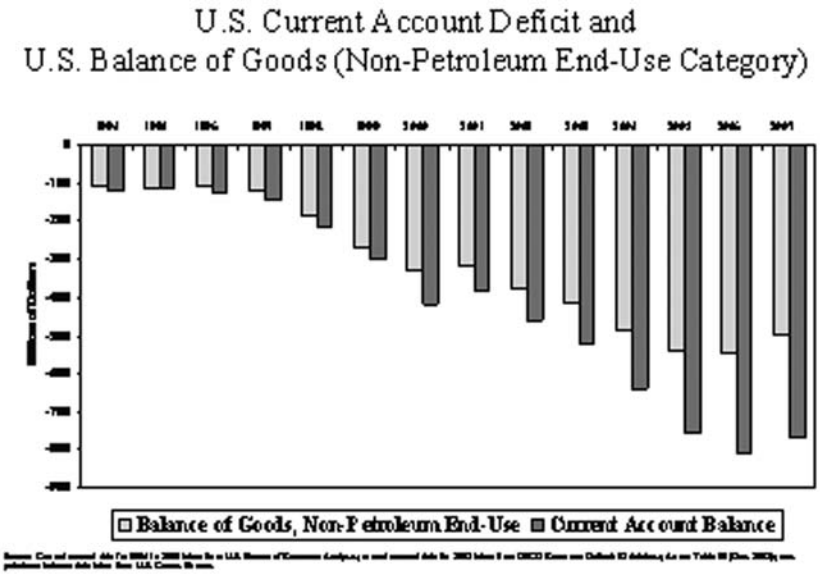
[2] I do briefly discuss below one alternative to a cap and trade system, namely a sector-based "standards" approach that has been advocated by some in industry.

lenges that would be presented to American workers and producers *if* new costs and burdens are placed on them, and some of the options available to Congress to address those challenges.

I believe that this is one of the most important issues facing Congress with respect to climate change legislation. It is an issue that received a great deal of interest in the context of the Senate climate debate that occurred earlier this year, and will no doubt remain paramount. Put simply, the ability to ensure that domestic producers are not placed in an untenable competitive position due to burdens under any new climate legislation will be essential to *both* the environmental goals of the legislation *and* the long-term health of our manufacturing sector.

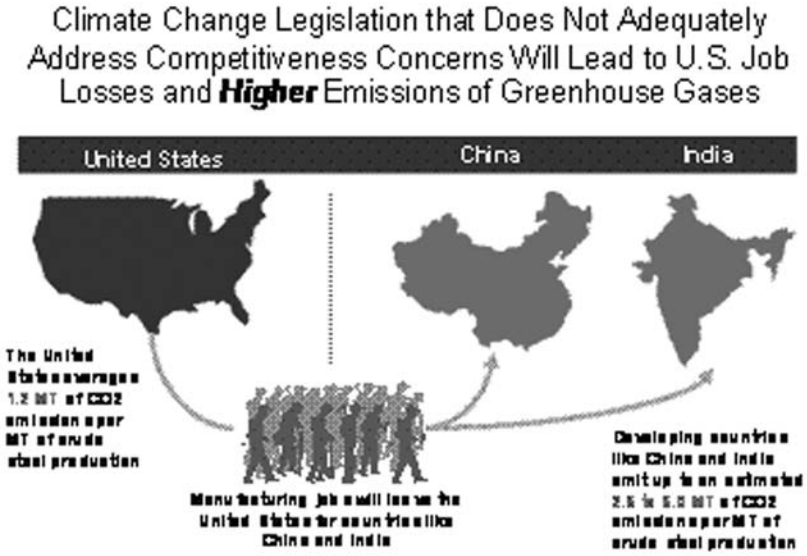
The importance of competitiveness issues to the success of climate change legislation is clear. No other country is so open to imports as the United States. Figure 1 below shows that last year our current account deficit exceeded $750 billion. While oil imports have been a part, Figure 1 shows that our overall deficit is chiefly the result of our trade imbalance in nonpetroleum goods. As this fact indicates, U.S. manufacturers in a wide range of industries face fierce import competition. Under these circumstances, relative changes in costs and/or economic incentives will invariably lead to the rapid substitution of foreign products for domestic products—and consequent severe injury to domestic industries. Thus, any measure (including climate change legislation) that places significant additional costs on U.S. manufacturers without imposing similar costs on imports will plainly harm U.S. workers and businesses, put additional pressure on core U.S. industries, and lead to a further worsening of our trade deficit.

Figure 1



The impact of poorly-designed climate legislation will not be limited to the loss of jobs and industries in this country. If new climate change legislation does not adequately account for the international competitiveness issue, it will create an incentive for manufacturing to leave the United States and be replaced by production in nations that often have far *less* rigorous environmental standards. This will result in *higher* volumes of greenhouse gas emissions worldwide—a result that directly contradicts the goals of climate change legislation. As shown in Figure 2 below, using the steel industry as an example, the substantially higher greenhouse gas intensity of steel production in places like China and India would mean that any shift in production to those countries would dramatically *worsen* global levels of CO_2.

Figure 2



Congress should keep this context in mind as it considers how to reconcile new climate change legislation with our WTO obligations. In light of this background, as well as an analysis of U.S. obligations under the WTO agreements, I wish to emphasize several critical points.

- *First*, it is absolutely imperative that the United States take meaningful actions to prevent imports from countries with less rigorous standards from undermining the effectiveness of any climate change legislation Congress may approve.
- *Second*, while the WTO agreements and case law provide no definitive guidance on these issues, there are sound arguments that the United States may place equal requirements on imports to account for emissions associated with those products, and to ensure that any new climate change legislation does not place U.S. workers and businesses at an unfair disadvantage vis-a-vis foreign producers. Hopefully, this can be done in conjunction with a negotiated agreement internationally that will clarify rules and ensure consistent treatment of traded products.
- *Third*, given the importance of this issue, we should clearly avail ourselves of the strong arguments available that the United States is permitted to place equal requirements on foreign products based upon emissions associated with those products. Indeed, if it were concluded that the United States does not have such authority, the implications would be profound—and would in my view be more than sufficient grounds for Congress to rethink the entire approach it is taking to the climate change challenge.
- *Finally*, we should recognize that placing equal requirements on imports only addresses part of the problem. It does not, in particular, address concerns that new climate requirements will undermine the competitiveness of U.S. products sold in foreign markets. For that reason, proposals that, where feasible, address competitiveness issues from both an import and export standpoint (e.g., by avoiding the imposition of new climate costs on industries facing strong global competition) may be optimal, particularly in the absence of a global approach to solving climate problems. To the extent new requirements are placed on domestic producers, however, it will remain critical to ensure that imports are subject to the same requirements—so as to ensure the viability of U.S. producers in their own market.

II. LEGAL BACKGROUND

New climate change legislation would potentially implicate U.S. obligations under several provisions of the WTO agreements. Although there is a great deal of uncertainty in this area of the law, there are sound arguments to be made in support of the view that the United States is permitted to place the same regulatory burdens on imports that are imposed upon domestic products.

The provisions and standards applicable to a measure that is applied to imports will vary significantly depending on whether it takes the form of a border measure or an internal measure enforced at the border. Article XI of the General Agreement on Tariffs and Trade ("GATT") generally prohibits any measure restricting imports at the border (*i.e.*, a border measure) other than normal import duties, taxes, or charges. However, a measure that is applied to *both* imports *and* the like domestic product, even if it acts to restrict imports, is *not* subject to Article XI. Indeed, a note to Article III of the GATT expressly provides that

> [a]ny internal tax or other internal charge, or any law, regulation or requirement . . . *which applies to an imported product and to the like domestic product* and is collected or enforced in the case of the imported product at the time or point of importation, is nevertheless to be regarded as an internal tax or other internal charge, or a law, regulation or requirement . . . *and is accordingly subject to the provisions of Article III*.

In other words, a measure that is applied to both an imported product at the border and the like domestic product (*i.e.*, an internal measure that is enforced at the border) is to be considered under Article III of the GATT, rather than Article XI.

In turn, the "national treatment" provisions of Article III:4 of the GATT provide that the United States must accord to imported products "treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution or use." Thus, if the United States imposes new legal or regulatory requirements on certain products, imports of those products must be treated no less favorably than like U.S. products. The requirements in question may be enforced on imports at the border, but they cannot discriminate against such imports. In this regard, the WTO Appellate Body has explained that "the purpose of Article III is to ensure that internal measures not be applied to imported or domestic products so as to afford protection to domestic production. Toward this end, Article III obliges members of the WTO to provide equality of competitive conditions for imported products in relation to domestic products."[3] Nevertheless, a WTO member like the United States may draw distinctions between like products without according to imported products less favorable treatment than that accorded to domestic products. The key is whether there is protection of domestic products in the marketplace.[4] Indeed, the Appellate Body recently stated that it was willing to accept a "detrimental effect on a given imported product" as long as it could be "explained by factors or circumstances unrelated to the foreign origin of the product."[5]

An issue that has been the subject of much debate is whether measures that distinguish between products on the basis of their process or production methods, rather than the physical characteristics of the products themselves, can be found to sufficiently affect the products so as to be subject to and upheld under Article III of the GATT. Environmental restrictions that focus on the manner of production are examples of such process-based measures or "PPMs." In the *Tuna-Dolphin* cases, two panels constituted under the former GATT dispute settlement system found that measures that conditioned the sale in the United States of both domestic and foreign tuna on the adoption of an environmentally-friendly fishing technology violated the GATT.[6] The panels found that such process-based regulatory measures fell outside the scope of Article III and instead were improper restrictions on imports under Article XI of the GATT.[7]

However, the *Tuna-Dolphin* decisions were never adopted and, therefore, carry no legal weight in the WTO. Moreover, there are good reasons to question the basis

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[3] WTO Appellate Body Report, *Korea—Measures Affecting Imports of Fresh, Chilled and Frozen Beef*, WT/DS161/AB/R, WT/DS169/AB/R (Dec. 11, 2000), at para. 135.

[4] WTO Appellate Body Report, *European Communities—Measures Affecting Asbestos and Asbestos-Containing Products*, WT/DS135/AB/R (Mar. 12, 2001) ("*EC—Asbestos (AB)*") at para. 100.

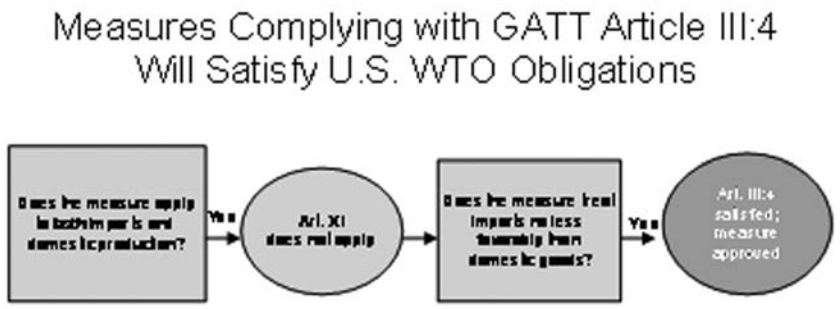
[5] WTO Appellate Body Report, *Dominican Republic—Cigarettes*, WT/DS302/AB/R (May 19, 2005) ("*Dominican Republic—Cigarettes (AB)*") at para. 96.

[6] *See United States—Restrictions on Imports of Tuna*, 30 ILM (1991) 1594; *United States—Restrictions on Imports of Tuna*, 33 ILM (1994) 936.

[7] *See id.*

for the product/process distinction created by the *Tuna-Dolphin* panels. A process-based measure of the type most likely to be at issue in the climate debate would appear to constitute a measure "affecting [the] internal sale, offering for sale, purchase, transportation, distribution or use" of the product so as to be subject to Article III:4.[8] While not resolving this issue, several decisions issued by the WTO provide a sound basis to argue not only that process-based measures are subject to Article III, but also that they should be found to satisfy the national treatment standards established therein where they are origin-neutral.[9] Based on the lack of legal support for the *Tuna-Dolphin* decisions and the developments in recent cases decided by the WTO, a number of commentators have concluded or suggested that the product/process distinction no longer has any validity (to the extent that it ever did) and that neutrally-crafted process-based measures or PPMs could or should be upheld under GATT Article III.[10] This type of analysis should provide adequate grounds for Congress to pursue regulatory measures that apply in an even-handed manner to both domestically-produced and imported products.[11]

Figure 3



Another issue that may require consideration relates to the so-called "most favored nation" ("MFN") provisions of Article I of the GATT. In this regard, and to the extent a climate regulatory measure was applied to imports from some foreign countries but not others (e.g., because those countries had in place their own climate measures), questions could well arise with respect to compatibility with Article I—which prohibits discrimination between imports from different countries. Certain arguments might be available under Article I to defend application of neutral criteria to exclude countries that have in place comparable climate regimes, but this is an uncertain area.[12] Having said that, to the extent country exclusions under a climate measure were found to be problematic under Article I, the U.S. would have a number of options, including: (i) not excluding any foreign countries; (ii) negotiating new

[8] *See* WTO Panel Report, *Mexico—Taxes on Soft Drinks*, WT/DS308/R (Mar. 23, 2006) at paras. 8.108–8.113 (adopting broad interpretation of the nexus required between taxes and other regulatory requirements and the products that they affect so as to warrant analysis of such measures under GATT Article III:4).

[9] *See id.*; *EC—Asbestos (AB)* at paras. 100–02, 113–115, 122; *Dominican Republic—Cigarettes (AB)* at paras. 93, 96.

[10] *See, e.g.*, Joost Pauwelyn, "U.S. Federal Climate Policy and Competitiveness Concerns: The Limits and Options of International Trade Law" (Nicholas Institute for Environmental Policy Solutions, Duke University) (Apr. 2007) at 19–26 (hereinafter "Pauwelyn"); Robert Howse and Elisabeth Tuerk, *The EU and the WTO—Legal and Constitutional Issues* 283, 297–98 (Grainne de Burca et al. eds. 2001); Robert Howse and Donald Regan, "The Product/Process Distinction—An Illusory Basis for Disciplining 'Unilateralism' in Trade Policy," 11(2) Eur. J. Int'l Law 249, 252, 254–56, 258–68 (2000); Henry L. Thaggert, "A Closer Look at the Tuna-Dolphin Case: 'Like Products' and 'Extrajurisdictionality' in the Trade and Environment Context" in 1 *Trade & the Environment: The Search for Balance* 69, 80–81, 83 (James Cameron et al. eds., 1994).

[11] I have focused herein on the likely analysis with respect to Article III:4, but it should be noted that a climate measure might well also be covered by (and defensible under) Article III:2—dealing with border adjustment of indirect taxes and other internal charges. Indeed, in the event a climate change measure (including, e.g., a requirement to submit emissions allowances under a cap and trade program) were analyzed as a "tax" or "internal charge," the provisions of Article III:2 would provide an additional ground to permit the border adjustment of such a measure. *See, e.g.*, Pauwelyn at 21–22.

[12] One consideration would be whether exclusion of certain countries might be justified based upon "like product" considerations. The U.S. might also be able to argue that the standard for excluding certain imports is applied in the same way to imports from all sources and thus meets MFN requirements.

rules internationally to allow such exclusions; or (iii) simply defending the exclusions based upon one of the GATT "exceptions" (which are discussed below).[13]

Even if a regulatory measure were found to violate the provisions of Articles I, III or XI of the GATT, this violation may be excused by one of the exceptions provided for in Article XX of the GATT. In particular, Article XX(g) provides an exception for "measures . . . relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption." To be entitled to an exception under GATT Article XX(g), three conditions must be met:

- First, the resource to be protected must be "exhaustible." Even a resource that is renewable, such as clean air, may be found to be "exhaustible."[14]
- Second, the measure at issue must be a measure "relating to" the conservation of the resource. To satisfy this condition, the Appellate Body has suggested there must be a "substantial" relationship between the measure and the conservation of the resource and the means adopted must be "reasonably related" to the ends.[15]
- Third, the measure must be "made effective in conjunction with restrictions on domestic production or consumption." The Appellate Body has said that this requires only "even-handedness" in the treatment of domestic goods and imports, not "equality of treatment."[16]

In addition to the three conditions that must be met under the specific requirements of GATT Article XX(g), a regulatory measure must satisfy the introductory clause or "chapeau" of Article XX to qualify for an exception under that provision. The chapeau of Article XX requires that measures not be applied "in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade." The WTO Appellate Body has interpreted this chapeau to require that an environmental measure be sufficiently flexible and take into account the different conditions that may exist in different foreign countries.[17] In addition, the Appellate Body has suggested that the country taking a measure must engage in "serious, across-the-board negotiations with the objective of concluding bilateral or multilateral agreements" on the problem that the measure is designed to address.[18] This does not require the actual conclusion of an agreement, but that a country make good faith efforts to reach agreements with all countries affected.[19] Finally, according to the Appellate Body's analysis, the implementation and administration of a measure must comply with principles of "basic fairness and due process."[20]

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[13] *See* Pauwelyn at 32–33.

[14] *See* WTO Appellate Body Report, *United States—Import Prohibition of Certain Shrimp and Shrimp Products*, WT/DS58/AB/R (Oct. 12, 1998) ("*US—Shrimp (AB)*") at para. 128; WTO Panel Report, *United States—Standards for Reformulated and Conventional Gasoline*, WT/DS2/R (Jan. 29, 1996) at para. 6.37.

[15] *US—Shrimp (AB)* at para. 141.

[16] *See id.* at paras. 144–45; WTO Appellate Body Report, *United States—Standards for Reformulated and Conventional Gasoline*, WT/DS2/AB/R (Apr. 29, 1996) at pp. 20–21.

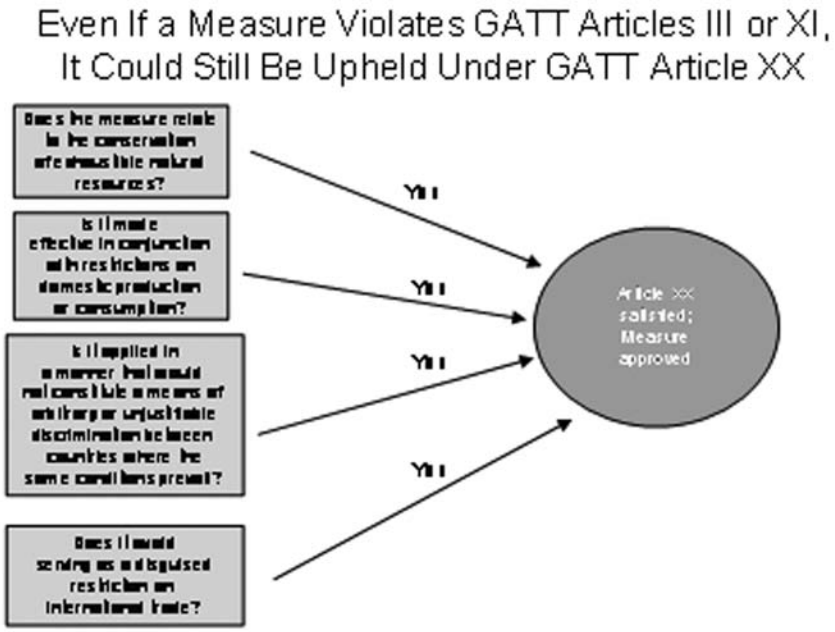
[17] WTO Appellate Body Report, *United States—Import Prohibition of Certain Shrimp and Shrimp Products (Implementation Under Article 21.5 of the Dispute Settlement Understanding)*, WT/DS58/AB/RW (Oct. 22, 2001) ("*US—Shrimp (Implementation Under Art. 21.5)*") at para. 144.

[18] *US—Shrimp (AB)* at para. 166.

[19] *Id.*; *US—Shrimp (Implementation Under Art. 21.5)* at paras. 122–124, 134.

[20] *US—Shrimp (AB)* at para. 181.

Figure 4



Notwithstanding the above analysis, I should caution that it is impossible to predict with any certainty in this (as in other) areas how the WTO Appellate Body will rule—particularly given the lack of clear precedent and the performance of the AB. In fact, I and a number of other commentators have been critical of the AB's decisionmaking in recent years, noting a tendency to stray from the clear terms and intent of the relevant agreements and repeated examples where the AB has effectively created new obligations under those agreements. This only adds to the uncertainty in assessing likely judicial rulings in the climate/environmental area—and offers yet another reason why the Committee may, in the future, wish to engage in a thorough review of the jurisprudence at the WTO and the adherence of the AB to the proper standard of review.

III. INTENSITY-BASED STANDARDS

Although the climate-change proposals currently receiving the most attention involve a cap and trade approach, I want to briefly discuss an alternative approach that has been suggested by certain industry officials. Under this approach, the U.S. Government would require everyone selling in this market—including both domestic and foreign producers—to live up to the "best practices" and articulated standards in terms of the carbon intensity of their manufacturing operations. Per-unit standards could be created for particular industries/product areas (e.g., iron, steel, aluminum, etc.) that result in significant volumes of greenhouse gas emissions. Of course, different standards would be employed for different manufacturing processes with respect to each product. Such standards could also be paired with incentives to encourage producers to develop and implement new practices that would further reduce greenhouse gas emissions.[21]

This type of approach would have two major advantages. First, because all producers active in this market would be subject to the same rules, this approach would give U.S. producers an opportunity to compete on even terms with foreign producers. Second, by holding producers worldwide to the most rigorous standards,

[21] Yet another alternative approach that could be adopted would be to impose a carbon tax on imports that is equivalent to the internal cost imposed on domestic products by climate change legislation. Such a carbon tax could be defended as a "border tax adjustment" that is permitted under WTO rules for product-related or indirect taxes (such as value-added taxes or sales taxes).

it would exert significant downward pressure on greenhouse gas emissions. As our trade deficit demonstrates, producers worldwide are eager to ship their goods to this country. Congress could use that fact to encourage greener production at home and abroad and a level playing field in our market. Intensity-based standards would encourage a "race to the top," where manufacturers worldwide compete to satisfy our requirements.

Moreover, there are strong arguments to show that intensity-based standards would be consistent with the United States' WTO obligations. In this regard, such standards should satisfy the national treatment requirements of Article III:4 of the GATT because they would treat imported products no less favorably than like domestic products. As an initial matter, it could be argued that imported products and domestic products that are produced through different manufacturing processes and that have different carbon intensities are not like products to begin with and that, as a result, there is no violation of national treatment if such products are treated differently. But even if they are considered like products, intensity-based standards would not discriminate against imports. To the contrary, imported products and domestic products would be treated exactly the same. Any distinctions that would be made between products would be based on the carbon intensities of the products. Such distinctions would be unrelated to the origin of the products and would not be made to afford protection to domestic production. Accordingly, there would be strong arguments that this type of approach complies with the requirements of GATT Article III:4.

In any event, even if intensity-based standards were not upheld under GATT Article III:4, they could be defended under the exception provided in Article XX(g) of the GATT. No concern about the protection of the environment is currently considered to be more important internationally than the conservation of the Earth's atmosphere through the reduction of greenhouse gas emissions and the resultant protection of the Earth's climate. In fact, there cannot be any real question that the planet's atmosphere is an "exhaustible natural resource" in the sense of Article XX(g). Intensity-based standards would also clearly "relate to" the conservation of the Earth's atmosphere and related climate. By requiring producers to comply with the best practices and highest standards for carbon intensity in their respective industries, intensity-based standards would reduce greenhouse gas emissions to the greatest extent possible and would certainly be "reasonably related" to that end. And as noted above, the standards would apply equally to domestic products and imports so that there clearly would be even-handedness in the imposition of the restrictions.

Furthermore, there are good arguments that intensity-based standards would satisfy the requirements of the chapeau of Article XX, even if one assumes that the specific requirements read into that chapeau by the Appellate Body in other litigation apply to this issue. The standards would take account of the local conditions in foreign countries and would not simply require that foreign countries adopt U.S. programs or policies. Foreign countries would be free to adopt any programs or policies, and foreign producers would be free to choose whatever manufacturing processes or technologies enable them to meet the intensity-based standards established by the United States. In particular, developing countries and producers in such countries would be provided with sufficient flexibility to take whatever steps are appropriate to satisfy the U.S. standards. The United States has also engaged and is engaging in "serious, across-the-board negotiations" to reach a multilateral agreement to address the problem of climate change. Thus, the United States is actively seeking to resolve this issue on an international level. Finally, intensity-based standards should unquestionably be applied in a transparent, predictable, and nondiscriminatory manner so as to comply with the principles of "basic fairness and due process" established by Article XX. Thus, intensity-based standards would present good arguments with respect to the necessary elements to be entitled to an exception under Article XX(g) of the GATT.

IV. INTERNATIONAL COMPETITIVENESS PROVISIONS IN THE CONTEXT OF CAP AND TRADE LEGISLATION

A. Principles Relating to Effective International Competitiveness Provisions

Congress currently has before it a number of proposals to use some type of cap and trade program to limit greenhouse gas emissions. These legislative proposals would, under certain circumstances, require importers to obtain allowances to account for emissions associated with imported products. I do not today intend to offer specific analyses of these legislative proposals. I will say that, while many of these proposals appear well-intentioned, much more work remains to be done to develop mechanisms that are both efficacious and meet WTO concerns. Adopting a competi-

tiveness provision that does not truly address the problem and that fails to create a level playing field would be the worst possible option—hanging our workers and companies out to dry and ultimately leading to greater, not fewer, greenhouse gas emissions worldwide.

Cap and trade legislation designed to cover the entire U.S. economy is inherently complex, and ensuring that such legislation does not result in a competitive disadvantage for U.S. producers will require careful thought and consideration. Nevertheless, there are a number of basic principles that should clearly inform any effort to regulate in this area, and that would help ensure that the legislation does not cause severe injury to the U.S. manufacturing sector and American workers. At the very minimum, Congress should make certain that: (1) any additional regulatory costs and burdens imposed on domestic products under the legislation should be equally borne by imports; (2) applicability of competitiveness provisions to imports is not subject to discretionary determinations that could undermine such provisions; (3) new regulatory requirements (including requirements to obtain emission allowances) should be fully applicable to imported products at the same time that they are imposed on domestic producers; and (4) imports from foreign countries should be fully subject to such requirements unless those countries are undertaking truly equivalent climate measures.

The type of provisions that must be avoided include the following:

- Granting broad discretion to exempt foreign countries based upon vague and open-ended standards that could let out major emitters early in the program;
- Providing discretionary authority to reduce the obligation of importers to obtain allowances based on factors that would not reduce obligations for domestic producers;
- Delaying the application of requirements to imports until some time after new obligations are placed on domestic producers;
- Failing to include adequate provisions to address the competitiveness challenges faced by downstream products and that would allow such products to compete on a fair footing with imports;
- Including arbitrary exclusions for small-emitting nations that could be very difficult to defend under WTO rules;
- Granting more favorable treatment for importers in the use of foreign allowances and credits than is provided for domestic producers.

Inclusion of provisions like these will not and should not receive support from workers and companies facing competitiveness challenges under any new climate legislation.

Fortunately, there are strong reasons to believe that enhanced and meaningful competitiveness provisions—consistent with the principles articulated above—could be incorporated into climate legislation without violating our WTO obligations.

B. WTO Considerations Relating to Strengthened International Competitiveness Provisions

Strengthened and effective competitiveness provisions should not present any significant additional WTO concerns—and could in fact make such legislation more defensible under the WTO by ensuring the most equal possible treatment among imports and domestically-produced products.

Again, competitiveness provisions in this regard would likely be subject to the national treatment requirements of GATT Article III:4. Because strengthened competitiveness provisions as described above would not discriminate against imports—but indeed would seek to ensure that the same costs and burdens are imposed on both domestic and imported products—there are strong grounds to argue that Article III:4 would be satisfied. Any distinctions that would be made between products would be based on the carbon emitted in their production and would simply ensure the very equality of treatment between imports and domestic products that is sought by GATT Article III:4.

Cap and trade legislation with effective international competitiveness provisions should also be found to satisfy the requirements for the exception provided in Article XX(g) of the GATT. As established above, the Earth's atmosphere is clearly an "exhaustible natural resource" under Article XX(g). A regulatory system that is consistent with the international competitiveness principles identified above would "relate to" the conservation of this "exhaustible natural resource" because it would account for emissions associated with imports, and would serve a vital role in ensuring that the environmental purpose of the bill is not undermined through importation of more carbon-intensive products. Moreover, the enhanced international competitiveness provisions would comply with the third condition of Article XX(g) in ensuring even-handedness in the treatment of domestic products and imports.

The requirements of the chapeau of Article XX—including the specific requirements that the Appellate Body has read into the chapeau in the context of other litigation—would also likely be met. The legislation would be sufficiently flexible in that it would not mandate the adoption of any particular system for the reduction of greenhouse gas emissions. Both importers and U.S. producers would have similar requirements in terms of the need to obtain allowances for the level of the carbon emissions associated with their products, and they could trade to obtain additional allowances if necessary. This would allow producers in developing countries, in particular, to decide for themselves what is the most feasible and appropriate way to reduce their emissions. Even if a developing country producer decided not to reduce emissions, it could still obtain access to the U.S. market through the purchase of additional allowances.

The international negotiations requirement would also likely be satisfied here because the United States has engaged and is engaging in negotiations to address the problem of climate change on a multilateral level. Lastly, any cap and trade system that is adopted could and should provide for emission allowances to be administered in a manner that complies with "basic fairness and due process." Accordingly, if cap and trade legislation is somehow deemed to violate Article III:4 of the GATT, solid arguments can be made that such legislation should nevertheless be upheld under GATT Article XX(g).

V. CONCLUSION

In conclusion, the need to fully and effectively address the competitiveness issues posed by climate change legislation is clear. Without such a resolution, the core policy goals of the legislation in terms of environmental protection will be undermined, and U.S. workers and the economy will suffer enormous harm. As outlined above, there are compelling arguments to find that the WTO system has sufficient flexibility to allow Congress to address these concerns and ensure that climate measures impact domestic products and imports in an even-handed manner. As such, any legislation in this area should ensure that equal burdens are placed upon imports and domestic products.

Chairman RANGEL. Thank you. At the appropriate time I hope Mayor Bloomberg would be able to respond to your observation.

We have Timothy Regan as our next member. I still think he is with Corning. He has had an outstanding background, and we look forward to your testimony here, this morning.

STATEMENT OF TIMOTHY J. REGAN, SENIOR VICE PRESIDENT, CORNING INCORPORATED

Mr. REGAN. Thank you, Mr. Chairman. Mr. Chairman, we come here to share a unique perspective. Corning is, on the one hand, an environmental technology company. We invented the materials that have removed billions of tons of harmful emissions from multiple sources.

On the other hand, we're a very, very energy-intensive manufacturer. We melt silica, and we cure ceramic, both of which use a lot of energy.

One point I want to make—and I think it's probably already been made, but I want to emphasize it—if our trading partners were to adopt a cap and trade system like the one that we decide to adopt, and they do it simultaneously with us, then I wouldn't be here today, taking up your valuable time.

There are some unintended consequences if we act unilaterally, and those unintended consequences are characterized in terms of loss of high wage manufacturing in the sectors that I represent here today, and they take the form of what we call environmental leakage. The world will not harmonize. We will probably go first.

So, I would urge you to take into consideration these unintended consequences as we move forward.

Energy intensive manufacturers are in a difficult position under a cap and trade program. It's going to raise prices, as we all know, of energy. Energy is an incredible source of the cost of production for the industry. In some cases, it's eight times higher than it is for manufacturing. We are going to have to absorb these costs. Because we operate in world markets, it's going to be very hard to pass these costs on.

So, we are going to be put in a cost price squeeze. So, why should you care?

Well, I think the reason why policymakers should care really involves two issues. One is that the industry is important, economically. Yes, we are small. But we are a source of high-wage employment. In 2006, energy-intensive manufacturers on average, paid 51 percent more in compensation to our employees than the rest of the economy.

Another reason we're important is because we're a large part, significant part, of the industrial base. We represented 20 percent of the U.S. manufacturing output in 2006. Another thing that is important is we're a large source of productivity growth. Over the last 3 years, we generated about 10 percent productivity growth, versus 4.6 percent of the economy. So, we really do drive real wages, and that's why we can pay more than other parts of the economy to our employees.

The second issue to be concerned about is this whole question of environmental leakage, which has already been described.

Now, we think you can devise a cap and trade program that will achieve emissions reductions, and at the same time avoid some of these adverse consequences. We think it should be designed around a couple of principles. Let me share them with you.

First, you have to narrowly identify the eligible sectors for compensation under such a program.

Second, you really want to neutralize for a time period, for a transition period, the cost of carbon that is incurred, both directly and indirectly, by these eligible sections. Directly, we produce emissions, we're going to have to cover those emissions. We're going to buy electricity, there is going to be an emission cost associated with electricity.

Third, you need to neutralize the indirect costs of energy that the industry is going to absorb, and those need to be understood. There is going to be a lot of fuel switching, for example, to natural gas. That will drive up the price of natural gas. That will then affect the cost of manufacturing for companies that use it as a feed stock, or to power our furnaces.

Fourth, the mechanism that you use should affect both imports and exports. Energy-intensive manufacturers export—we account for about 13 percent of U.S. exports. We have manufacturing facilities in the United States that export 100 percent of their output.

I want to emphasize that compensation systems don't have to be free allowances. They can be in the form of tax rebates, or in the form of some assistance for health care costs, et cetera. But those kinds of systems, if designed properly, can avoid the problems we're talking about, and they can be useful, in terms of addressing

the competitiveness problem as it relates to both exports and imports. I want to emphasize that point.

Now, if you can't develop such a system of compensation, because there are all kinds of competing needs—then you need to go to border adjustment. If you go to border adjustment, we would strongly recommend that you try to minimize your WTO risk of challenge, but don't let it become a block.

Finally, while we understand that all this will be temporary, we would caution against premature termination.

We want to do our part. We are an environmental company. We're not afraid to do our part. But we want to help design a system that is going to deal with these unintended consequences, and we want to work with you to do that. Thank you very much.

[The prepared statement of Mr. Regan follows:]

Prepared Statement of Timothy J. Regan,
Senior Vice President, Corning Incorporated

I. *Introduction*

Mr. Chairman, it is an honor to appear before you today to speak to you about the critical issue of climate change and the policy options for addressing it.

I am a Senior Vice President with Corning Incorporated, a manufacturer of critical glass and ceramic components used in a variety of high-tech products ranging from fiber optic telecommunications systems to environmental control systems and liquid crystal displays ("LCDs") for computer and consumer electronics. We are headquartered in Corning, New York, and have facilities in 12 other States.

While we have been manufacturing in the United States for over 157 years, we are very much a high-tech company that consistently spends at least 10% of our revenue on research, development, and engineering. Corning is a four-time winner of the President's Medal of Technology for our inventions like fiber optics.

I am here today to discuss the climate change issue for two reasons. First, we are an environmental technology company. We invented the ceramic substrate material that is critical to the operation of catalytic converters and devices that reduce emissions from diesel engines. Since it was first put into use in 1975, our technology has removed over 1.5 billion tons of pollution from American skies and 3 billion tons worldwide.[1]

Second, we are a significant consumer of energy in the forms of electricity and natural gas. As such, we will be significantly affected by climate change legislation that increases the cost of energy from both sources. For example, Census data shows that energy constitutes 17 percent of the value of shipments for flat glass, which is over eight times the average proportion for manufacturing generally in the United States.[2] Fundamentally, we are in the business of melting silica and other compounds and curing ceramic, all of which use enormous amounts of energy.

I am not here today to endorse a specific proposal to address the climate change problem. Rather, I am here to help you assess the impact of a cap and trade system on energy-intensive manufacturing and to suggest some principles that you might use in a cap and trade program. I believe the debate on cap and trade is still in a formative stage, and I commend the Committee for sponsoring this inquiry to examine the policy options for moving forward.

Energy-intensive manufacturing is particularly vulnerable in a cap and trade system because:

- such a system will necessarily increase the cost of energy as it will create a new cost of carbon that must be absorbed by manufacturers directly and indirectly as it is passed downstream to them by their energy suppliers;
- energy constitutes a large portion of the cost of production for energy-intensive manufacturing like glass, steel, ceramics, and chemicals; and

[1] *See* Corning Press Release citing the Manufacturers of Emission Control Association ("MECA") (February 15, 2005), "<http://www.corning.com/environmentaltechnologies/media-center/press-releases/2005021501.aspx>.

[2] *See* Figure 1, p. 4, and Annual Survey of Manufacturers: General Statistics: Statistics for Industry Groups and Industries, U.S. Census Bureau, 2006.

- the competition in energy-intensive manufacturing is global in nature making it difficult to pass through the increased cost of energy downstream to end users.

With respect to global competition, I would like to emphasize that energy-intensive manufacturing firms face competition in *both* import and export markets. Unfortunately, the debate so far has focused on imports. The impact on exports has been largely ignored. Corning and many other energy-intensive manufacturers are significant exporters.

I believe that the policy challenge is to construct a cap and trade system that can effectively reduce carbon emissions without causing job loss in high-wage manufacturing or "environmental" leakage. Such leakage occurs when production shifts from the United States, where emissions are regulated and energy costs are high, to countries where emissions are not regulated and energy costs are low. This outcome is undesirable because it would result in the loss of high-wage manufacturing jobs and merely shift the geographic source of emissions, not reduce them.

Let me assure the Committee that we are willing to do our part to help solve the climate change problem as the United States leads the world in adopting effective measures to reduce greenhouse gases. But, we believe that special measures should be incorporated into any U.S. cap and trade program to address the unintended consequences of job loss in energy-intensive manufacturing and environmental leakage that could occur unless and until our trading partners implement a comparable system of regulation to reduce greenhouse gases. Fortunately, a consensus is beginning to evolve on the need for these special measures.

II. *Energy-Intensive Manufacturing Poses a Unique Challenge*

Energy-intensive manufacturing needs special attention in a cap and trade program for three reasons. First, it is a critically important segment of the U.S. economy. Second, this sector is particularly vulnerable to an increase in energy cost driven by a cap and trade system. And third, failure to address special challenges of energy-intensive manufacturing will lead to the loss of high-wage jobs and environmental leakage.

Energy-intensive manufacturing[3] is critical to the economy because it is a source of high-wage jobs, it represents a large portion of the U.S. manufacturing base, and it is a major source of productivity growth.

Energy-intensive manufacturing generates high-wage employment that is substantially higher than the norm. As indicated in Table 1 below, energy-intensive manufacturers provided their employees with average wages and benefits at $78,609 for 2006. This is a full 51% higher than the U.S. overall average of $51,934 and 16% higher than the average for U.S. manufacturing generally at $67,545. Adopting measures in a cap and trade system to assist energy-intensive manufacturers will help protect these high-wage jobs.

Table 1

Relative Average Annual Compensation for 2004–2006

[millions of current dollars]

	2004	***2005***	***2006***
Overall U.S. Average	$47,885	$49,818	$51,934
All U.S. Manufacturing Average	$62,682	$64,869	$67,545
Energy-Intensive Manufacturing Weighted Average	$73,053	$76,595	$78,609

Sources: U.S. Department of Commerce, U.S. Census Bureau, Annual Survey of Manufactures, Statistics for Industry Groups and Industries, 2004–06. U.S. Manufacturing Total: U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Annual Industry Accounts, Gross Domestic Product (GDP) by Industry, 2004–06.

Energy-intensive manufacturing is also critical to the economy because it represents a large portion of the American manufacturing base. As indicated in Table 2 below, the value added by energy-intensive manufacturing to the economy in 2006 represents 20% of the value added by all U.S. manufacturing. So including meas-

[3] For the purpose of the analysis contained in this testimony, I will use a definition of energy-intensive manufacturing that is included in most of the major proposals to date. These include glass, ceramics, iron, steel, pulp, paper, cement, rubber, chemicals, and aluminum and other nonferrous metals. Appendix A identifies the specific industrial codes used by Census to track these industries.

ures in a cap and trade program to address the challenges of energy-intensive manufacturing will help secure a large portion of the American manufacturing base and the high-wage jobs associated with it.

Table 2

Relative Industry Value—Added (GDP component) for 2004–2006

[millions of current dollars]

	2004	***2005***	***2006***
All U.S. Manufacturing	$2,090,063	$2,167,245	$2,324,545
Energy-Intensive Manufacturing	$397,112	$433,449	$464,909
Energy-Intensive Manufacturing Share	19%	20%	20%

Sources: U.S. Department of Commerce, U.S. Census Bureau, Annual Survey of Manufactures, Statistics for Industry Groups and Industries, 2004–06. U.S. Manufacturing Total: U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Annual Industry Accounts, Gross Domestic Product (GDP) by Industry, 2004–06.

Finally, energy-intensive manufacturing is critical to the economy because it is an important source of productivity growth. Such growth is important because it drives growth in real wages. Table 3 reflects the average value added per employee for energy-intensive manufacturing relative to the rest of the economy and to manufacturing in general. The change in value added per employee is a good measurement of relative productivity growth.

Table 3

Relative Average Productivity (value added per employee) for 2004–2006

[current dollars]

	2004	***2005***	***2006***
Overall U.S. Average	$83,989	$88,037	$91,922
All Manufacturing Average	$152,413	$167,936	$177,485
Energy-Intensive Manufacturing Weight Average	$325,304	$362,811	$393,550

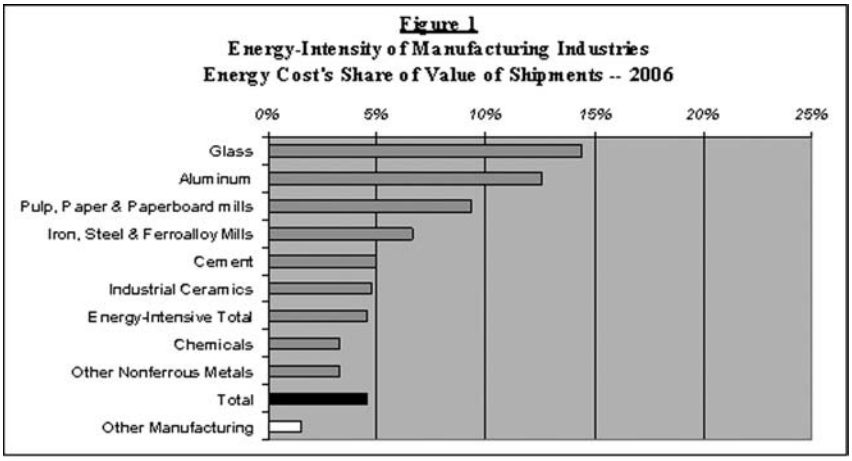
Sources: U.S. Department of Commerce, U.S. Census Bureau, Annual Survey of Manufactures, Statistics for Industry Groups and Industries, 2004–06. U.S. Manufacturing Total: U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Annual Industry Accounts, Gross Domestic Product (GDP) by Industry, 2004–06.

These data show that productivity growth in energy-intensive manufacturing at 10% far exceeds that of the economy overall at 4.6% and all manufacturing at 7.9%. In other words, productivity growth in energy-intensive manufacturing is over twice that of the economy overall. So including measures in a cap and trade program to address the problems of energy-intensive manufacturers will help maintain a primary source of productivity growth in the economy.

In addition to being critical to the overall economy, energy-intensive manufacturing is also very vulnerable to the effects of a cap and trade program. I describe below how such a program will likely increase both the direct and indirect costs for energy-intensive manufacturing. There are many paths through which these costs increases will be channeled.

Unfortunately, energy-intensive manufacturers are very vulnerable to these cost increases for two reasons. First, energy is a significant portion of their cost of production, a proportion greater than that of most sectors of the economy. Second, because energy-intensive manufacturers face global competition, they will encounter difficulty passing on these increased costs downstream to their customers.

Figure 1 demonstrates graphically the significance of energy costs for energy-intensive manufacturers. On average, such costs represent 5% of the value of shipments of energy-intensive manufacturers. This is over twice that of other manufacturing at 2%. In certain sectors, the difference is even more significant. For example, in the glass sector, energy represents 17% of the value of shipments for flat glass manufacturing, 15% for glass container manufacturing, and 12% for other glassware manufacturing.



Source: Census Data Annual Survey of Manufactures: General Statistics: Statistics for Industry Groups and Industries; 2006 U.S. Census Bureau.

Clearly, the cost of production for energy-intensive manufacturers will increase significantly by any increase in energy cost that is driven by a cap and trade program.

These increased costs cannot be easily passed on by energy-intensive manufacturers downstream to their customers because they face competition in both export and import markets. As indicated in Table 4, energy-intensive manufacturers depend heavily on export markets. A full 11% of their output was exported in 2006, a level which is twice that for the economy overall. Some of Corning's facilities export nearly 100% of their output. And energy-intensive manufacturers face import competition with imports accounting for 19% of consumption overall. Import competition is most apparent in the primary metals sector at 30% of consumption.

Table 4

Export Intensity and Import Share of Energy-Intensive Manufacturing for 2006

	Export Intensity (exports as a % of output)	**Import Share** (imports as a % of consumption)
Nonmetallic Mineral Products	5%	16%
Primary Metals	10%	30%
Paper Products	9%	15%
Petroleum and Coal Products	6%	13%
Plastic and Rubber Products	17%	24%
Chemical Products	9%	15%
All Energy-Intensive Manufacturing	11%	19%

Source: U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Annual Industry Accounts, Annual Input-Output (I–O) Accounts, Summary Make and Use Annual I–O Tables, 2006.
*Note: Total consumption = Intermediate consumption + personal consumption.

Fortunately, a consensus is evolving on the need to address the special needs of energy-intensive manufacturing in the context of a cap and trade program. Policymakers are beginning to recognize: (1) that energy-intensive manufacturing is critical to the economy because it generates high-wage jobs, and (2) that it is vulnerable to an increase in the cost of energy driven by a cap and trade system. They are concerned that this vulnerability will force environment leakage, a production shift from the United States, where carbon is regulated and energy costs are high, to

other geographic regions where carbon is not regulated and energy costs are low. Such a shift would hurt the economy without improving the environment.

As a result, many proposals to date include special provisions to partially and temporarily compensate energy-intensive manufacturers for the significant cost that they must absorb under a cap and trade program. These proposals also include temporary border measures to assess the cost of carbon on imports of energy-intensive products from countries that do not have programs to effectively regulate carbon emissions. Generally, the industries affected by these compensation and border adjustment mechanisms include glass, ceramics, iron, steel, pulp, paper, cement, rubber, chemicals, and aluminum and other nonferrous metals.[4]

Some of our friends in the environmental community have expressed support for these proposals. They are appropriately concerned about the environmental leakage and job loss in energy-intensive manufacturing that could occur under a cap and trade system. And, they have expressed support for giving energy-intensive manufacturing facilities some direct compensation in the form of "free allowances" and for border adjustment measures provided that both are temporary, limited, and used as a tool to encourage other countries to adopt "comparable action" to control greenhouse gas emissions.[5]

The international community also recognizes the special needs of energy-intensive manufacturing. In its reform proposal, the European Commission notes that, although auctions are the most efficient method for allocating allowances, it remains concerned about carbon leakage. In the event that a global agreement to control greenhouse gas emissions cannot be reached, the Commission recommends that energy intensive manufacturers subject to global competition receive up to 100 percent of allocations for free to avoid job loss and carbon leakage.[6]

III. *Cost Impact of Energy-Intensive Manufacturing*

To design a mechanism to avoid leakage and economic dislocation in energy-intensive manufacturing, one must first understand how a cap and trade program will likely impact the cost of manufacturing. For the purposes of this discussion, I will assume that a cap and trade system will be established that reduces greenhouse gas emissions by 60% to 80% from 1990 levels by the year 2050.

Such a system will require firms that emit greenhouse gases, mostly CO_2, to redeem an allowance for every "carbon equivalent ton" of emissions. The administrator of the program will issue these allowances annually by declining volumes over time so as to force a reduction in emissions slowly to the targeted level in 2050.

A portion of these allowances will be made available to some facilities at no cost, but the free allowances will not be sufficient to accommodate all of the needs of all facilities. There will be a shortfall that must be accommodated by purchasing emission allowances in an auction market. The market will set the price of carbon emissions.

Achieving a 60% to 80% reduction below 1990 levels will have a significant impact on energy-intensive manufacturers because it will require that they absorb both direct and indirect costs associated with the cap and trade program. Direct costs will arise from the purchase of allowances to cover emissions that a manufacturer produces directly from its own processes (e.g., in Corning's case burning natural gas to melt silica). This is called the direct cost of carbon. Direct costs will also arise from investment in new technology to increase fuel efficiency. These direct costs can be easily identified.

The indirect costs that an energy-intensive manufacturer must absorb under a cap and trade system are derived from the increased cost of electricity and other energy sources that are driven by the cap and trade system. These indirect costs will be driven by four factors:

- the cost associated with allowances that energy suppliers (i.e., electricity, natural gas, and fuel oil) will have to purchase in the auction market (i.e., the indirect cost of carbon);

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[4] Lieberman-Warner (S. 2191), Boxer Substitute (S. 3036), Investing in Climate Action and Protection Act (Markey H.R. 6186) and Climate MATTERS (Dogget H.R. 6316) all contain provision for transition assistance for energy-intensive manufacturing.

[5] Testimony of David D. Doniger, Climate Center Policy Director, Natural Resources Defense Council, February 28, 2008, before the Committee on Energy and Commerce Subcommittee on Energy and Air Quality, p. 11.

[6] Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community, Brussels, 23.1.2008 COM(2008) 16 final, 2008/0013 (COD), p. 16.

- the cost associated with "fuel switching" by electricity suppliers (i.e., the purchase of higher-cost, lower-carbon fuels like natural gas);
- the cost associated with investment by electricity suppliers in new technology like carbon capture and sequestration and renewable sources; and
- the rising cost of natural gas driven from fuel switching upstream that energy-intensive manufacturers must absorb to maintain their own operations.

These indirect costs are more difficult to identify.

I share this detail for the purpose of demonstrating the myriad ways in which energy-intensive manufacturers can be affected by a cap and trade system. A mechanism that can effectively contain leakage and prevent economic dislocation for energy-intensive manufacturers should neutralize these direct and indirect costs. Most proposals that have been introduced to date focus solely on the direct and indirect cost of carbon, that is, the cost of allowances to cover CO_2 emissions by the manufacturer and its energy suppliers. They do not address all of the other indirect costs noted above.

IV. *Design Principles*

I do not have a specific proposal to share with the Committee on how to address the leakage problem or the challenges that a cap and trade system will likely create for energy-intensive manufacturers. Rather, I would like to present some design principles that the Committee might consider in developing a mechanism for incorporation into a cap and trade system to address the leakage problem and the challenges of energy-intensive manufacturers. I suggest that you consider seven design principles.

First, the mechanism should clearly identify the types of manufacturing facilities or product categories that will be eligible for compensation under a cap and trade system. Specifying industry sectors in the legislative language would certainly be desirable for planning purposes. This has been done in many proposals to date. Generally speaking, the proposals have identified glass, ceramics, iron, steel, pulp, paper, cement, rubber, chemicals, and aluminum and other nonferrous metals. The legislative language should also include a set of criteria that the administrator could use to add new sectors and product categories.

Second, the mechanism should neutralize the cost of carbon for eligible energy-intensive manufacturing facilities. This can be done by allocating enough free allowances to each eligible facility to cover all of its direct emissions (i.e., the direct cost of carbon), plus enough to cover the net allowance cost of their electricity supplier (i.e., the indirect cost of carbon). The net allowance cost is the difference between the allowances that the electricity supplier must redeem to cover its direct emissions and the free allowances that it is granted by the administrator of the program. If electricity suppliers do not get enough free allowances, they will have to purchase them on the auction market and pass the cost on to their manufacturing customers. Calculating the cost of carbon is not difficult for well-managed firms.

Most proposals to date use free allowances to partially compensate energy-intensive manufacturers for the direct and indirect cost of carbon. But this can also be done through a tax rebate or credit mechanism. Under such a program, manufacturers would receive a tax rebate or credit large enough to offset the cost of carbon that is inherent in every unit of output. It can be designed to have about the same impact as a system of free allowances, but may be easier to administer and may generate more predictable results.

Third, the mechanism should neutralize the noncarbon indirect costs for eligible energy-intensive manufacturing facilities. These costs would involve the noncarbon costs that are passed on to the manufacturer by its energy suppliers. These noncarbon costs include the cost of fuel switching to natural gas by electricity suppliers, as described above, and the cost of investment in new technology incurred by the electricity suppliers to reduce their carbon footprint. This would also include the increased cost of natural gas to the manufacturer that arises from fuel switching. Admittedly, identifying these costs will be difficult, but they could be significant and, therefore, should be accommodated to the maximum extent possible in order to fully address the leakage and competitiveness problems.

Fourth, such a mechanism should address the competitiveness issue as it relates to both imports *and exports*. The debate so far has focused almost exclusively on imports. But energy-intensive manufacturers are significant exporters. In fact, energy-intensive manufacturing accounts for 14% of all U.S. exports. It is unwise to

put these exports in jeopardy especially in light of the fact that the U.S. economy is relying on exports to generate more than one-third of our economic growth.[7]

Every effort should be made to provide compensation to energy-intensive manufacturers through free allowances or tax rebates to neutralize the direct cost and indirect cost associated with the cap and trade program. It is the most efficient way to address the leakage and competitiveness problems in the context of a cap and trade system. If compensation is adequate, it will prevent leakage and job loss in energy-intensive manufacturing. Importantly, it addresses the problems as they relate to both competition from imports and competition in export markets. It should be noted, however, that competing demands for free allowances have made it very difficult to fully compensate energy-intensive manufacturers for the direct and indirect costs associated with cap and trade system. If full compensation is not possible, effective border adjustment measures will be necessary.

Sixth, if border adjustment measures are adopted, the mechanism should minimize the risk of the WTO challenge, but the risk of challenge should not block action. Experts have testified before Congress that a WTO-compliance border adjustment measurement can be developed.[8] I will defer to the legal experts on this question. But if there is any doubt, I suggest that the Committee direct U.S. negotiators to negotiate arrangements now in the Doha Round to remove such doubt.

Finally, the mechanism of compensation or border measures to address the challenges facing energy-intensive manufacturers should not be prematurely terminated. The mechanism will be temporary pending adoption by our trading partners of comparable measures to regulate greenhouse gases. But those measures should be adopted and implemented before the mechanism is terminated. Premature termination could generate high-wage job loss and promote leakage.

V. *Conclusion*

Energy-intensive manufacturers are particularly vulnerable to an increase in energy costs that will no doubt arise from the implementation of a cap and trade program. This is due to the fact that energy accounts for a large portion of their cost of production, and these manufacturers will encounter difficulty passing these increased costs on to their customers because energy-intensive manufacturing faces competition in *both export* and import markets.

A cap and trade program should address the special challenges it creates for energy-intensive manufacturers for two reasons. First, they are an important source of high-wage employment and economic growth. Second, production adjustments that may result from a cap and trade program could result in the loss of high-wage jobs and environmental leakage. A production shift from the U.S. market, where carbon is regulated and energy costs are high, to another region where carbon is not regulated and energy costs are low, is neither in our economic interest nor in our environmental interest. Indeed, it will hurt the economy without improving the environment.

Fortunately, a consensus is evolving on the need to include mechanisms in a cap and trade program to address the special needs of energy-intensive manufacturing to avoid high-wage job loss and leakage. These measures should neutralize the increased direct and indirect costs imposed on energy-intensive manufacturers by a cap and trade program. A compensation system of free allowances or tax rebates can most efficiently offset these increased costs. If sufficient compensation is not possible, border measures that minimize the risk of a WTO challenge can be implemented. But these measures should not be terminated until our trading partners implement comparable measures to regulate greenhouse gases.

Mr. Chairman, thank you for the opportunity to appear before you.

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[7] *See* Economic Report of the President, Chapter 3, The Causes and Consequences of Export Growth, February 2008, p. 79.

[8] *See* Testimony of Michael G. Morris, Chairman, President, and Chief Executive Officer, American Electric Power Before the House Energy and Commerce Subcommittee on Energy and Air Quality and attached WTO opinion of Sidley Austin LLP, February 28, 2008.

APPENDIX

Table 1: Energy-Intensive Industries

Industry	Products	NAICS Code
Glass	Flat glass manufacturing Other pressed and blown glass and glassware manufacturing Glass container manufacturing	327211 327212 327213
Aluminum	Alumina refining Primary aluminum production Secondary smelting and alloying of aluminum	331311 331312 331314
Pulp, Paper, and Paperboard Mills	Pulp Mill Products Paper Mills Paperboard Mill Products	322110 322121 322130
Iron, Steel, & Ferroalloy Mills	Iron and steel mills and ferroalloy manufacturing	331111
Cement	Cement manufacturing Ready-mix concrete manufacturing	327310 327320
Industrial Ceramics	Industrial Ceramics	327113
Chemicals	Chemicals	325
Other Nonferrous Metals	Copper and other nonferrous metal manufacturing	33141

Sources: Boxer Amendment S. 3036; U.S. Department of Commerce, U.S. Census Bureau, Annual Survey of Manufactures, Statistics for Industry Groups and Industries, 2004–06.

Chairman RANGEL. The House soon will be taking votes, but we will have the opportunity to listen to our last witness, and then may have to take close to a half-hour break. I will just advise you of that.

But Clyde Hufbauer—is it Clyde or Gary?

Mr. HUFBAUER. Gary.

Chairman RANGEL. Gary Hufbauer is going to share his views with us. He is an expert in taxes and trade, and has done a lot of work in this area, lectured and authored. We are so glad that you are able to share those views with us. Thank you.

STATEMENT OF GARY CLYDE HUFBAUER, REGINALD JONES SENIOR FELLOW, PETERSON INSTITUTE FOR INTERNATIONAL ECONOMICS

Mr. HUFBAUER. Thanks very much, Mr. Chairman, and Members of the Committee. I am delighted that this Committee will be asserting its jurisdiction, because it has as its core concern, as you noted, the WTO and international trade rules, and I do not think that's an area that should be consigned to the States.

Second, the revenue implications are very large, as Peter Orszag and many others have noted. I think permits are the same as revenue, and they shouldn't just go out the door without the surveillance of this Committee. So, I applaud the initiative.

My institute, the Peterson Institute for International Economics, and the World Resources Institute are conducting major research in this whole area, and we have published one book, another one is coming along, and others will follow.

As you have noted, the proposals that are before the Congress embody two main approaches: carbon taxes and cap and trade. But there are also performance standards in the discussion. All of these have their advantages and disadvantages. But the bottom line is that any of these approaches, if serious, will impose very heavy costs on U.S. economy, and those costs will be highly concentrated on a few industries, as Mr. Regan and Mr. Lighthizer have noted.

So, this has given rise to the competitiveness concerns which have already been mentioned. These competitiveness concerns have, really, two dimensions: one, immediate impact on particular industries; and second, trying to do something to give an incentive to countries like China and India to step up to the plate. The bills before Congress have both concerns in mind. The logic of some kind of international dimension to the bills is, therefore, quite clear.

I have appended a table to my testimony which shows where the carbon intensive manufacturers are coming from, on the import side. Not to go into any detail, but you will note that most of our carbon-intensive imports come from OECD countries which, on average, as Mayor Bloomberg has noted, are cleaner, according to various indices and scores, than the United States.

So, we shouldn't think that carbon-intensive goods are all coming from China or India, because they are not. The statistics are clear.

The problem of doing things at the border and pressuring other countries along the lines that Mr. Regan mentioned is that anything we do to other countries they can do to us. We could be big losers. Importantly, the world trading system, which has been a major source of economic growth in this country and the world since the second world war, would be at risk.

I think it's appropriate to remember, in this week particularly, that Wall Street crashed first in the Great Depression, but Smoot-Hawley came second. A round of trade restrictions in the name of climate change could be the Smoot-Hawley of our times, or the potential Smoot-Hawley.

Now, turning to the WTO rules as they presently exist, I would offer three head notes. One, they were written long ago. They were written in a period when climate change was on nobody's mind. Second, there have only been very few cases—and we summarize them in our forthcoming book—only about six or eight cases which have had anything to do with this issue. The decisions leave a lot of room for questions to be decided. So, the jurisprudence is very scarce.

With that in mind, our recommendation is for U.S. legislation, or the legislation of other major countries, to provide a pause before border measures are imposed, a pause for a short period of time, 3 or 4 years, to try to negotiate a new WTO code that outlines what is permissible, what is not.

Thank you very much, Mr. Chairman.

[The prepared statement of Mr. Hufbauer follows:]

Prepared Statement of Gary Clyde Hufbauer, Reginald Jones Senior Fellow, Peterson Institute for International Economics

Mr. Chairman and Members of the Committee, thank you for inviting me to testify. My name is Gary Hufbauer and I am a Senior Fellow at the Peterson Institute for International Economics. In May 2008, the Peterson Institute and the World Resources Institute jointly published a book titled "*Leveling the Carbon Playing Field*."

The book analyzes the intersection between greenhouse gas (GHG) emissions, competitiveness, and international trade.[1] Currently, my colleagues and I are writing a monograph titled "*Reconciling GHG Limits with the Global Trading System*," which focuses on U.S. climate policy options and their consistency with the WTO.[2] This testimony reflects findings from both works.

Major Concerns With U.S. Climate Change Legislation

Facing rising domestic and international pressures, several GHG control bills have been introduced in the 110th Congress. The proposals embody two main approaches, namely carbon taxes and cap and trade systems. Performance standards are a secondary feature of some proposals. Each system has its own mix of advantages and disadvantages. However, whether the limits take the form of a carbon tax, a cap and trade system, performance standards, or some other method, it must be emphasized that serious GHG controls will impose heavy costs on the U.S. economy, and the costs will be concentrated on a short list of GHG-intensive industries and activities. The prospect of heavy costs has raised concerns about the competitive position of U.S. producers and the "leakage" of production and jobs to foreign firms. In the absence of parallel international commitments, U.S. measures might shift manufacturing activity to China and India, among other countries that do not limit GHG emissions. In the end, U.S. controls might make no difference to climate change if emissions activity simply migrates abroad. To address these concerns, U.S. legislators have drafted special provisions in their GHG control bills such as free allocation of allowances, special exemptions, and border adjustments that would affect both U.S. exports to and imports from countries which do not have comparable climate policies.

Questionable Effectiveness of Trade Measures

Trade-related rules, such as an emissions allowance requirement imposed on foreign producers at the U.S. border, have gained political support, both because they address the competitiveness issue and because they arguably create incentives for other countries to join in combating global warming. The logic of this approach is clear. However, it is questionable whether trade measures will achieve the goals sought. Indeed, it is quite possible that trade measures, if imposed by several major countries, will adversely affect the United States.

The United States imports carbon-intensive goods largely from Canada and the European Union—countries that emit less CO_2 than the United States. China and India, the primary targets of U.S. trade measures, are not large suppliers of carbon-intensive exports to the United States. In 2005, China accounted for less than 10 percent of U.S. carbon-intensive imports except cement: 7 percent of steel imports; 3 percent of aluminum imports; 4 percent of paper imports; and 14 percent of cement imports (Houser et al., 2008, pp. 44–45). Also, while China accounted for 32 percent of global steel production, it exported only 8 percent of steel produced in 2005, and less than 1 percent was sold to the U.S. market (Houser et al., 2008, p. 54).

These statistics imply two things. First, trade measures may not provide intended economic relief to domestic industries affected adversely by U.S. climate change policy because U.S. firms are competing mostly with "cleaner" countries; and second, that U.S. trade measures may not create substantial leverage to shape climate change policies of other countries—particularly China and India.

In proposed U.S. legislation, trade measures are generally imposed on imports unless the trading partner enacts domestic climate policy "comparable" to the U.S. policy. As the trade data mentioned above shows, the largest foreign suppliers to the United States of carbon-intensive goods are countries like Canada and the European Union, and these countries emit considerably less carbon than the United States either on a national basis or a per capita basis. Moreover, the European Union has already enacted more stringent GHG measures than the United States, and Canada may soon do the same. "Comparability" tests imposed by the United States could be turned around by other countries—starting with the European Union—to implement similar measures against imports from the United States. This sort of escalation would damage U.S. industries in the global market.

Moreover, a round of global trade restrictions, enacted in the name of climate change, would interrupt the agenda of trade liberalization which has proven enor-

[1] Houser, Trevor, Rob Bradley, Britt Childs, Jacob Werksman, and Robert Heilmayr. 2008. *Leveling the Carbon Playing Field: International Competition and U.S. Climate Policy Design*. Washington: Peterson Institute for International Economics and World Resources Institute.

[2] Charnovitz, Steve, Gary Clyde Hufbauer and Jisun Kim. 2008 (forthcoming). *Reconciling GHG Limits with the Global Trading System*. Washington: Peterson Institute for International Economics.

mously successful in boosting world economic growth since the Second World War. The damage to the world economy would be severe. Recall that trade barriers were a hallmark of the Great Depression. Wall Street collapsed first; Smoot-Hawley was passed second.

Trade Measures and the WTO

While the WTO allows member countries great flexibility in adopting environmental standards within their territories, the same discretion does not apply in their trading relations with other countries. Accordingly, trade barriers have the potential to conflict with WTO rules. In light of economic history, WTO rules that limit national actions should be counted as a blessing.

To be specific, when GHG trade measures are mixed with mechanisms designed to alleviate the burden of emission controls on domestic firms, the possibility arises of a collision with WTO rules. The table appended to my testimony provides a quick view as to which U.S. climate policy options with respect to imports might be justified under particular GATT articles. If the United States enacts its own unique brand of import bans, border taxes, and comparability mechanisms—hoping that measures which violate GATT Articles I, III and XI will be saved by the exceptions of GATT Article XX—the probable consequence will be a drawn-out period of trade skirmishes, possibly escalating to trade wars.

One way to determine whether such trade measures in support of GHG emission controls are compatible with WTO agreements is to let the dispute settlement process run its course. In the end, a record of decided cases will define the contours of WTO obligations. However, given the complications and sensitivity of GHG controls, the Appellate Body is unlikely to produce clear guidelines for several years. Moreover, consigning these decisions to a panel of jurists would put tremendous stress on the WTO system, which is already under siege.

Recommendation

A central issue in designing U.S. climate change policy is how to level the playing field internationally. Given uncertainties in their effectiveness and possible conflicts with WTO rules, trade measures may not offer the best approach. Given the fact that large emitting countries—notably China and India—are also under domestic and international pressures, the United States might better address competitiveness concerns by actively engaging in international negotiations. Two forums for international engagement are relevant: Copenhagen and WTO.

At upcoming negotiations in Copenhagen, to be concluded in December 2009, a post-Kyoto regime is meant to be agreed. Importantly, both the United States and China—which are not only the largest sources of GHG emissions, but the cause of great concern over the outcome of climate negotiations—are expected to join the international regime. While the post-Kyoto compact may not reach agreement on uniform international standards, engagement of the United States and China will build significant momentum which could draw stronger commitments from India and other developing countries. In this way, the United States may partly address its own competitiveness concerns.

While the post-Kyoto regime will probably announce new ambitious targets for reducing GHG emissions, and commit both developing and developed countries to take action, national governments will likely be left to their own methods for meeting targets. Under this scenario, conflicts due to difference in climate change policies are all but certain. Consequently, many cases might be brought to the WTO. Rather than consign the crucial decisions to the WTO judicial system, in my judgment, key WTO members should attempt to write a new WTO Code of Good Practice on GHG rules. The idea is to define more sharply the policy space for climate control measures that are consistent with core WTO principles, even if a technical violation of WTO law might occur. To encourage WTO negotiating efforts along these lines, the United States and other important emitting countries should adopt time-limited "peace clauses" into their own climate legislation. The "peace clause" would suspend the application of border measures or other extra-territorial controls for a defined period of time (say 3 years) while WTO negotiations are underway.

Thank you, Mr. Chairman. I will be happy to answer questions.

Table 1. US Climate Policy Options on Energy Intensive Imports[a]

Restriction on Imports		Justified under GATT Articles?				
		Article I *(MFN)*	**Article II** *(Tariff Schedules)*	**Article III** *(National Treatment)*	**Article XI** *(Quotas)*	**Article XX** *(Exceptions)*
Import restriction applied to penalize 'foreign emitted carbon' (measure applied *only* against imports)	*Import ban (quantitative restriction)*	***Status Unclear***		***(Covered under Article XI)***	***No because:*** Violated	***Yes.*** If any provision or restriction on imports can be justified under Article XX, it is permitted even though it violates other GATT rules. Recourse to an Article XX exception is scutinized carefully and the burden of proof is on the country seeking to invoke the exception. The measure has to qualify under a specific exception in Article XX, such as Article XX(g) as a measure relating to the conservation of natural resources. In addition the measure must meet the test in the Article XX chapeau, namely, that the measure is not applied in a manner that constitutes arbitrary or unjusifiable discrimination or as a disguised restriction on international trade.
	Additional or punitive tariff	***No because:*** Punitive tariff may differ between partners	***No because:*** Violates bound tariffs	***No because:*** A similar tax is not applied to domestic goods		
	Anti-dumping or countervailing duties	***No.*** Under present GATT rules, even if the exporting country does not restrict its carbon emissions, the social cost of carbon cannot be labeled as dumping or a subsidy. The failure to impose a carbon tax, or otherwise internalize the full price of carbon, does not currently give other WTO members the right to impose penalty duties on imports. In addition, such measures would violate the SCM and Antidumping Agreement for which no Article XX exception would be available.				
Competitive provision applied as an extension of domestic US climate policy (measure applied *both* to domestic production and imports)	*Carbon tax*	***No if:*** Foreign countries are treated differently		Not violated. Carbon taxes can be justified as an 'Internal tax" under GATT Article III:2 and thus can be adjusted at the border.		
	Cap-and-trade system with applicability to imports	***No if:*** Foreign countries are treated differently		A violation could occur if imported products are treated less favorably than like domestic products		
	Carbon performance regulation applied to products and the production process	***No if:*** Foreign countries are treated differently		A violation could occur if imported products are treated less favorably than like domestic products. The TBT Agreement may also be implicated		

a. Cells are in shadow when the referenced GATT articles are not likely to be relevant to the restriction in question.

Source: Adapted and updated from Pauwelyn, Joost. 2007. *US Federal Climate Policy and Competitiveness Concerns: The Limits and Options of International Trade Law*. NI WP 07-22. Nicholas Institute for Environmental Policy Solutions. Duke University

Chairman RANGEL. Those bells mean that the Members here will have 15 minutes to vote on the previous question. Then, after that, we will have a vote on the rule which will follow in 5 minutes, which means that there would be a total of at least 20 minutes that we will be absent.

But, since we do have some time—the Capitol, as you well know, is 5 minutes walking—perhaps I will yield my time as Chair to my distinguished Mayor to ask, how do you respond to the question that moving in the direction that some of us think is right, and you do, that it could be the destruction of our manufacturing base and the end of our jobs and economy as we know it?

Mr. BLOOMBERG. Mr. Chairman, I am just fascinated by the focus on competitiveness based on price. I have always thought that any industry or any company that its business model says they're going to be the low-price producers is doomed to failure. I think we have seen that repeatedly throughout the world.

If you go to China, you will see the failed policy of being the low-cost producer. In the eastern part of China they have vacant factories, where all the business has moved west, because people in western China will work for less than they do in eastern China. Business is leaving China and going to Bangladesh and Vietnam and Sri Lanka, because people there will work for less.

You will always find somebody working for less. If America's competitiveness is going to be based on being the low-cost producer, because you have low-cost labor, or you have low-cost energy, it's just a failed policy. This country has to compete on technology, it has to compete on having the best and the brightest. You will only get those people if we improve our environment, if we adopt new technologies, if we train our workforce.

One of the great things about reducing pollution through cap and auction, or through a carbon tax, is you could use the money to do exactly that, to retrain our workforce so that we can be competitive down the road. I think, as one of the gentlemen pointed out, a lot of the European countries are much more energy efficient than we are, and they are able to compete with us when it comes to cost.

The great strength of America is our workforce, and it is the regulations we have that ensure quality. You are seeing that, the big scandal in China, of this milk contamination. If you haven't been reading about it, you should, because it's devastating for the Chinese economy. They had the problems with lead in toys coming here, and cat food. That destroys their markets overseas.

We have to go and address this issue, and improve the environment, and improve the quality of American products. If we do that, I think it's good for business. I think there are plenty of examples of that.

Nobody wants to go home and say to their constituents, "You're going to have to pay more for something." But if you explain to them that the value of that is that this country can become more competitive, rather than less, that the air they breathe is going to be better, then I think the public, the American public, is willing to listen to that.

The time has come for this Committee, both sides of the aisle, to pull together and to say, "We cannot afford to sit around and spend another 4 years trying to negotiate with other countries

overseas. What we have to do is do it by—lead by example. Do it here first." It's tough enough a political lift for us. If you're going to wait for the rest of the world, it's just not going to get done. We are the big losers. Thank you for giving me the opportunity.

Chairman RANGEL. Mr. Lighthizer, what do you have to say about that?

Mr. LIGHTHIZER. Well, since we are a major presence in New York City, I have to be very careful.

Mr. BLOOMBERG. That's all right.

Mr. LIGHTHIZER. Skadden Arps. I would say my argument is not that we shouldn't do anything. But I think that it is wrong to think that you're going to take the 3 or 4 or 5 or 6 or 7 million workers, some of whom are in steel mills, and you're going to retrain them to design computer chips.

Right now, they are making the best—taking steel as an example—they are making the best product in the world, they're making the cheapest in the world. They are competing with the entire world, and they're doing pretty well. But to come in there and say, "Look, we're going to add $70, $80, $90 a ton to your cost, and not add it to your competitors," is, in my opinion, a serious mistake, and bad for the economy, and unfair to all of those people.

What I'm saying is, fine, if your judgement is that it's so important that we do this, that we clean up the environment—and it is important to do it—at least do it in a way that is sane and it is fair to basic manufacturing. I think you can do both, if you do it right. So, I'm not really disagreeing with the Mayor.

All I am saying is it's nice to talk about it all being information technology. It's nice to talk about it all being financial services. It's great. But in the real world, there are millions of people that are working very hard, doing a great job, and they shouldn't be penalized because of this other objective. You can do it in a way that doesn't penalize those people.

Chairman RANGEL. Thank you. We are going to go to vote, and then, when we come back in approximately 20 minutes, I will yield to Mr. McCrery, and then the Members will have their time.

I apologize for this interruption, but that's what we're here for, to vote.

[Recess.]

Chairman RANGEL. The Committee will resume. But I just want the panel to know that we have received nothing but accolades as to the quality of the testimony and the timeliness of the Congress making certain that we moved on this before we left.

So, collectively, I want to thank you and yield to my friend, Jim McCrery.

Mr. MCCRERY. Thank you, Mr. Chairman. I certainly share with those from whom you have heard giving accolades about the panel. Your testimony was excellent, and we look forward to continuing to work with you, as we go through this issue in the days to come.

I was actually pleased that there was so much back and forth discussion about some of the things I mentioned in my opening statement, primarily the impact on the economy, the impact on jobs in this country, and particularly on those energy-intensive industries. I know that a couple of you—or several of you—in your writ-

ten testimony, actually outlined some possible approaches to mitigating the adverse impacts on those industries.

I just wonder if you might go over orally before the Committee, some of those possibilities, and tell us what traps there may be, if you will, in pursuing some of those possibilities, whether it's WTO or tax policy, or whatever. Dr. Orszag, will you start?

Mr. ORSZAG. Sure. My written testimony discusses two broad approaches. There are others. The first involves transitional assistance.

So, for example, if you had a cap and trade program, handing out some of the permits to the affected sectors and firms, and in particular, and the important part, is tying that to what they do. So, saying, "You get these for free, but you must basically continue producing," because without that tie, they're—just giving them a permit won't necessarily get what you want.

The second broad approach involves border adjustments, which we have already heard some about, which would involve imposing some sort of requirement on imports that are coming in in those sectors to obtain a permit. On that latter point, there is a—there are issues involving our World Trade Organization obligations.

Relevant to this Committee is that one line of defense involves articles two and three under the WTO, which speaks about a tax. So it would raise the issue of the degree to which a cap and trade is the same as a tax, another of which is applicable under article 20. I think—my understanding, although there are lawyers here who can speak to it more professionally than I—is that that appears to be a more auspicious avenue for the border adjustment system that may be part of any cap and trade system.

Mr. MCCRERY. Yes. Dr. Burtraw.

Mr. BURTRAW. I would just like to add to that that I guess there is a third approach, which is some kind of performance standard.

The problem with the border tax adjustment is that if we were using a tax in the U.S., it would make some sense under WTO. But if we're using cap and trade in the U.S., then you have this problem of what is the adjustment that's being made, how do you calibrate that? Is it to the value of emission allowances last year, or yesterday? This is a—these volatile prices in a market opens the door for litigation under the WTO.

The approach I favor is the first one Dr. Orszag mentioned, which is free allocation of allowances. You heard me earlier speak strongly against free allocation. This is a different kind of free allocation that occurred under the SO_2 program, where there was a one-time grandfathering of allowances. Instead, as Dr. Orszag emphasized, it would be an output-based allocation, and it would be updated on an annual basis, tied to value added and economic activity.

So, if Corning continues to keep jobs on shore, then it would continue to earn a free allocation, and the level of that allocation would be benchmarked to best practice in the industry. That way, Corning has an incentive to continue to try to remove emissions in its production activities, but it would not be placed in unfair competition in either its import or export markets, because it wouldn't

be having to pay for emission allowances, at least up to that level that is best practice in the industry.

But this would have to be revisited on an ongoing basis. When that competition goes away, there should be a Federal agency charged with developing criteria to measure the level of foreign competition. When that competition goes away, this subsidy should go away.

Mr. MCCRERY. Tim, what do you think about that approach?

Mr. REGAN. I have no problem with it at all. You don't want to create some sort of a windfall for manufacturers. You want to design something that's going to secure their competitiveness in the United States. So, making some sort of a condition on maintaining your operation in the United States strikes me as quite legitimate.

I also think that that approach of using those kinds of allowances would help on the export side, because we would be able to maintain our competitiveness without having to worry about some sort of an export subsidy to offset the cost of carbon. Expert subsides give to real serious WTO issues.

So, you know, the idea of using allowances as we just described strikes me as a good way to deal with the export problem.

Mr. MCCRERY. Thank you. Mr. Chairman, my time has expired. But thank you very much for your contributions. I would have liked to have gotten Mr. Lighthizer's comments on the WTO problems, but somebody else may get to that. Thank you.

Chairman RANGEL. The Chairman would like to recognize the Chairman of the Subcommittee on Trade, whose expertise we're going to rely on to see how this affects our ability to be competitive.

Mr. LEVIN. Thank you so much, Mr. Chairman, and thank you, all of you, for coming.

You know, as I listened to your testimony, it struck me that there remains a basic issue that we have to resolve, and I hope we do that in the coming months, and that is the basic question of whether global warming presents a serious, severe challenge, or does it not.

I am often surprised about how the lines fall on this, in trying to understand. Those who have been in denial, reluctantly perhaps now agreeing a bit, and those of us who have felt for some time that it is, indeed, a deep challenge, if it is, for those of us who have been working for alternative fuel measures, we can't believe that it will provide enough of an answer soon enough.

As to trade policy and the article 1, 2, 3, 11, 20, there seem to be ways to put together a system that would meet the requirements. If not, we're in negotiations. To simply say that it will—to endanger liberalization, Mr. Hufbauer— we know each other well—I think assumes that global warming isn't enough of a challenge that we cannot maintain trade liberalization and address a serious problem.

If I might say so, I don't think it helps to bring up the ghost of Smoot-Hawley. We are well beyond that. In terms of the competitiveness, people who have been working on this are sensitive to it. Many who are saying we've got to do something about global warming, it's a severe challenge, have been leading the effort to try to help make us competitive and to maintain jobs in this country.

So, we've got to face up to the issue, is this global warming issue a very serious, severe challenge, or is it not?

I think, Carol, you have talked a lot about this. I don't know whom to ask, but one of you—all of you—just describe briefly, what do we face?

Ms. BROWNER. Well, I think it is probably the greatest environmental challenge of our time. The consequences of inaction are, in many instances, things that cannot be corrected.

For example, sea level rise. Once we start to experience the consequences of sea level rise, the reality of sea level rise, there is not an engineer in the world who can help us drop the sea. I mean, this is a hard issue because we're asking people to take significant action before we can actually see, feel, and touch all of the consequences.

Mr. LEVIN. Some of it we have touched already.

Ms. BROWNER. Some of it we've touched already. The other thing I think that's really important to note about the scientists, the climate scientists, when they have predicted what the consequences will be, and as we've started to realize some of those consequences, all of their predictions have been on the lower end than what the reality is.

So, we didn't understand, for example, that there would be feedback loops, and so that with ice melting, it would be more complicated than simply the icebergs melting.

So, you know, it's—I don't know that—none of us are scientists here, and I don't want to say anything on behalf of other people, but you know, you have never, ever, in the history of the world, had agreement like we have among the scientists on what the consequences are going to be, and how severe they will be, and the need for action sooner, rather than later.

Mr. LEVIN. Dr. Orszag, you were shaking——

Mr. ORSZAG. I would agree with that. I would just say in a sense we are conducting a very significant experiment with the globe without a backup plan, and without, you know, the ability to rerun the experiment if things turn out poorly.

We are running a very significant, long-term risk, and the question is how we buy insurance to reduce that risk.

Mr. LEVIN. Thank you.

Chairman RANGEL. Thank you. The Chair recognizes the distinguished Member of the minority, Mr. Herger.

Mr. HERGER. Thank you, Mr. Chairman, and our witnesses. Incredibly important issue that we're dealing with, working with. I believe it's considered important by everyone.

I don't think it's a case that, for the first time in the 2½, 3 billion year history of the Earth, that we're seeing climate change, because we continually see climate change. I think what's important is that we're not unjustly hastening that.

I think what is important is that there is a right way, and a positive way to deal with this. I think there is a wrong way and a negative way to be dealing with this. I think we have heard some testimony on—having to do with that.

I would like to just add, from a report that I have here, a study that was done. I believe Mr. Reagan mentioned the unintended consequences that we can have of our actions. So often, we learn

the hard way of this. Smoot-Hawley was brought up. Unintended consequences to our actions to solve something. We need to be thinking very carefully what we do, that we—those who don't learn from history are doomed to repeat it. Hopefully, we won't do that because we will think it through.

One of these unintended consequences, a study that was done by the American Council for Capital Formation, estimates just in my State of California, in just 11 years, if the cap and trade proposal of the Lieberman-Warner were to go in, an estimated as many as 195,000 jobs lost, just in California in the next 11 years. And 10 years beyond that, by 2030, as many as 449,000, almost 450,000 jobs lost. Again, unintended consequences.

So, what we do, we want to do in a positive way. I believe there is many positive things we can do.

I would like to mention that—I mentioned in my—noted in my opening statement about trade liberalization is an important tool to reduce greenhouse gas emission, both here and in the United States and abroad. For that reason, Mr. Brady and I have introduced the Green Export Enhancement Act of 2008. This bill provides the United States Trade Representative with the authority to negotiate the elimination of tariffs on environmentally friendly technology.

This is a positive way that we can engage our international partners in an effort to reduce greenhouse gas emissions. The removal of these trade barriers will support the export of cutting edge technology, developed and manufactured by American workers. It will also speed the adoption of technology that developing countries would need if they're going to reduce their greenhouse gas emissions.

This bill is a positive step in engaging our international partners, addressing concerns about climate change, and does not impose significant increases in energy prices on the American family, particularly at a time when the American family is hurting, when we're in an economic downturn.

I would like to hear from our witnesses today as to whether or not they support trade liberalization and environmental technology.

Why don't we start with you, Mr. Hufbauer, and just move across?

Mr. HUFBAUER. Absolutely. This should be done. The reason we haven't reached an agreement on this very constructive approach in the WTO is that the U.S. has taken ethanol out of the package. It's very simple. You don't put ethanol in, as the U.S. environmental contribution, no package.

Now, I am not a big ethanol fan, in terms of saving CO_2, but I think we at least should include ethanol in the talks.

Mr. HERGER. So, you support it. Mr. Regan.

Mr. REGAN. Sure. We actually do it. We manufacture environmental control devices, and we export them. Matter of fact, we have a plant in Blacksburg that makes the core of a catalytic converter, and 70 percent of its output is exported.

We have a plant in Corning, New York, that manufactures diesel particulate filters for diesel cars, 100 percent of its output is exported to Europe. So, yes, we love to export. To the extent that you can eliminate barriers to our exports, we would appreciate it.

Mr. HERGER. Thank you.

Chairman RANGEL. Thank you so much. The Chairman has been informed that Mr. Lighthizer and Administrator Browner will not be able to stay; they have to leave earlier. But I hope that both of you will receive questions from Members of the Committee and respond in writing. Any Member that would want to direct questions to them do so in writing.

At this time, I would like to yield 5 minutes to the distinguished doctor on our Committee, Jim McDermott.

Dr. MCDERMOTT. Thank you, Mr. Chairman. Often in the United States, we fail to learn from what the rest of the world is doing. Europe has done this cap and trade business. I would like to hear from you what they did right, what they did wrong, what they did with the money.

There has been a suggestion we should perhaps use some of the money for education, or for health care, or whatever. I would like to hear what the European experience has been, so that we don't have to recreate the wheel if it's already been discovered and working so well somewhere else.

Ms. BROWNER. I think it is worth looking at what Europe has done, and there are some important things to learn. Probably the most important thing we can learn is why they ended up in a situation where they created a windfall profit for the electric utility sector.

In essence, what they did is they were giving away the credits, but they were allowing the utilities to pass on 100 percent of the cost. So, they were, you know, sort of paying utilities to do what they needed to do, but of course, allowing costs to be passed on to the consumer, and that created a windfall. We certainly want to avoid that, I think, in any program that we structure.

I am not aware about what they actually spent the money on. Someone else may know that.

Mr. ORSZAG. Well, again, since they actually gave away most of the permits, there wasn't actually money to be spent. As they're moving into the next phase, and there will be more auction, there will be a larger component that's auctioned, there will be, sort of, questions about how that revenue would be used then.

The other thing that I think is important to highlight, and that I understand is an issue under the RGGI, the regional initiative that's underway, is you have to be really careful about how you set the initial targets. Because if you project targets that are—or caps that are—very high, relative to what the base line turns out to be, you wind up with very, very low permit prices, and not much constraint coming from the cap, itself.

That is more of a sort of technical forecasting question.

Dr. MCDERMOTT. Did their idea—excuse me, go ahead.

Mr. BURTRAW. Well, I just would like to add two other things. You know, agreeing with what I have learned so far about lessons learned from the EU, one is that the Europeans themselves have learned this lesson.

After investigations in the UK, Germany, Netherlands, and elsewhere, the European Commission has proposed—and it looks like it's going to be adopted—that, beginning in 2013, there will be 100 percent auction of allowances for the power sector, and phasing in

100 percent auction for the rest of the affected sources over the next decade.

The second thing that they learned sorely after the first phase is they had no banking in between phase one and phase two. So, even though, as Dr. Orszag just mentioned, there was sort of what they call over-allocation, the cap was kind of slack in the first phase, there still would have been an incentive to reduce emissions if companies had had the ability to bank allowances into the future, because then there would have been reward for early auction. But instead, what happened is that those allowances took—went right to zero, because there were too many of them.

You have heard—there is a variety of arguments that we've offered up today for why the ability to bank, giving you inter-temporal flexibility, is really key to industry to help industry plan for the future. It's really key for the economy, because it smooths the impact of the program on the economy. So, that's a critical element.

Dr. MCDERMOTT. Has there been any thought about companies that have already done things somehow being able to benefit by this plan in the future?

I mean, while we dither here in Congress, there are businesses out there making decisions right now. Their—I mean, I can at least see why they might say, "Look, could you put retroactively the date as of X date, if we did something after January 1, 2006," or 2007, or something——

Ms. BROWNER. I think——

Mr. ORSZAG. Could I note that's only—oh, sorry, go—just—that's only an issue if you're giving the permits away. If firms have to buy the permits, then the reward to that past action is they won't have to buy as many.

Dr. MCDERMOTT. Okay, excuse me. You have already——

Ms. BROWNER. Economists always say it better than former regulators.

Dr. MCDERMOTT. Well, I have, then, this question of the use of the money. Since we're going to auction—we all agree that the Europeans made the mistake of giving it away, and now they're going to auction it. So, they're going to be in the same place we will start from, I presume.

There will be some money from this auction. Where should it go? I mean, is health care a public good that we should think about in this country, since we have a problem in trying to finance a health care reform of some sort, or is there some other place that you think makes more sense?

Some people have talked about retraining, and that may be it, but——

Ms. BROWNER. You know, obviously, this is a—what you, as Members of this Committee and Congress will get to do, is decide where to spend the money. I would encourage you to think about helping low-income families, less fortunate people, deal with some of the costs. I think we all agree there will be increased energy costs, for example. So, perhaps something through the earned income tax credit, some vehicle for helping to offset the increase in energy costs that would inevitably hit certain parts of—you know, certain families in our country harder.

Dr. MCDERMOTT. Yes, go ahead.

Mr. BURTRAW. I agree. This is why they pay you the big bucks, to make this decision. So, I want to offer just a couple of principles on how to think about it. I argued earlier for simplicity and transparency about that.

I think it is necessary for the American public to see that there is a link to what happens to this revenue. Now, whether—if it goes to health care, there is an argument to be made for that. If it goes to tax reform, there is an argument to be made for that. If it goes to dividends right back to households, that's another way that they would see immediately that the costs that they're paying through higher energy bills, they're seeing back through some kind of regular dividend from the government.

Whatever you do on any of those choices, I think the public needs to feel like they own this program, and they are participating in this program. Because we don't know now for sure, but it's possible over the next decade we're going to go back to the American public and ask them to do more. There has to be a sense that this is a national effort.

If there is just too many threads here, and the money gets carved up in a lot of different ways, two bad things happen. One is you lose that simplicity, and the public doesn't have a sense of owning or participating in this together. Second, it puts the United States behind the eight ball with respect to Copenhagen in 2009. Because at the end of 2009, there is going to be international conventions in Copenhagen. If the U.S. could do something before then, it could move us out front on the international stage.

If you can resolve what to do with all this money in a complicated way before then, that would be kind of a surprise to me, but a simple approach, maybe something could be done at the beginning of the next Congress, I don't know.

Dr. MCDERMOTT. I have made the proposal for the stimulus package for gasoline stamps. That is some way to mitigate the additional cost that people are spending on gasoline. That is also a way that I suppose you could help low-income families, either through the oil heat that they would have to buy, or the gasoline.

These ideas, do they make sense? Are they the kind of transparency that you're talking about?

Mr. ORSZAG. I guess I will be a little bit of a contrarian. I think one thing one needs to be careful about is you can provide assistance to low-income households. But if you tie that to their consumption of energy—so, for example, a gas stamp—you're undermining part of the incentive to become more energy efficient for those households, also, as opposed to something like the earned income tax credit, or just a simple cash injection that will still, at the margin, give them some incentive, like other households, to be more energy efficient, to the extent that they can.

Dr. MCDERMOTT. The idea being, if you give them a gas stamp, they will buy gasoline and drive to work, rather than take the bus, which would be a more efficient way.

Mr. ORSZAG. That may be one manifestation, right.

Dr. MCDERMOTT. Okay. Yes?

Mr. BURTRAW. There are other proposals out there that have some logic. For example, free allocation to electricity consumers through allocation to local distribution companies. The virtue here

is that it would soften the change in electricity prices, which is politically attractive, but it has the same downfall that Dr. Orszag mentions in the electricity sector.

It lowers the cost of electricity consumption, and it makes it so that you're going to have to get more emission reductions from natural gas. Or, if you drive a car, in that case you might be concerned about it. Or, if you heat your home you might be concerned about it, you know, with natural gas. But if you're an industrial facility and you're buying natural gas, you might be concerned about the fact that natural gas prices are going to go up, and that allowance prices are going to go up.

Our modeling suggests that free allocation to the electricity sector would raise allowance prices by about 15 percent. So, that's a cost that has shifted to other sectors of the economy.

Earlier today we heard this idea—I think the Mayor was the one who mentioned—the law of one price is what we really want to strive for here, treating all sectors of the economy equally.

Dr. MCDERMOTT. One of the things some of us in the northwest worry about is we already have hydro, and we've got a whole lot of wind. So we're wondering exactly how this is all going to work for us. But I yield back the balance of my time.

Chairman RANGEL. The chair is pleased to recognize Mr. Camp for 5 minutes.

Mr. CAMP. Well, thank you very much, Mr. Chairman. You know, at its core, from what I have heard today, cap and trade proposals are designed, really, to increase energy costs, which will result in increased production costs for those who generate energy.

Dr. Orszag, in your Senate testimony—and I quote—you said, "Price increases would be essential to the success of a cap and trade program."

Now, these increased costs are then passed along and placed primarily on energy-intensive manufacturers. Obviously, being from Michigan, most people think I am referring to automobiles, but really new manufacturers—and I'm thinking of, in my district, the crystal solar wafers that are manufactured for the solar industry is now the single most energy-intensive user in the State of Michigan. It's a very intensive energy user. Yet, it would be penalized under this sort of proposal.

So, Dr. Orszag, on page 15 of your testimony today you point out that energy-intensive manufacturing would experience a decline in sales, employment, and profits, as a result of a cap on carbon emissions.

Now—and I note the National Association of Manufacturers has done a study, and they look at my home State of Michigan and say that as many as 120,000 jobs would be lost by 2030. Given what our State has been through, that's a significant concern.

Also, by 2030 we could see disposable household income drop as much as $7,000 per family. Prices of gasoline would increase between 72 and 141 percent by that same date. Michigan residents would pay between 112 and 160 percent more for natural gas by 2030.

So, my question to you is, with dramatic increases in energy inputs, combined with the world's highest effective corporate tax rate in the United States, won't cap and trade incentives—won't cap

and trade incentivize more American companies to leave the United States and set up operations offshore? Has CBO done an analysis of the potential offshoring effects of a cap and trade policy?

Mr. ORSZAG. First, let me just say, as I noted not only in the Senate Finance testimony, but also just with respect to this Committee in today's testimony, price increases are an essential part of having a cap and trade program work. That price signal is crucial.

I think some of the numbers that were cited with regard to particular estimates for particular pieces of legislation may be somewhat exaggerated. But there is a cost to reducing the risk associated with global climate change.

We have not done an analysis of the degree to which U.S. corporate activity would shift to other countries, but as—especially with regard to these energy-intensive industries, which are a small share of the total economy, but nonetheless are a part of the economy, there would be some shifting, even under the kinds of approaches that have been put forward for border adjustments, and what have you.

The question is the magnitude. Most of the analysis that I have seen suggests, especially from the macroeconomic perspective, that would be somewhat limited, and certainly somewhat smaller than the numbers you were suggesting, but still part of what is going to have to happen here.

Mr. CAMP. All right. I have a question for anyone who would like to answer, not just for Dr. Orszag.

Obviously, we are looking at policy options today, not whether it be carbon taxes or cap and trade. Many of those presume that the path—as you mentioned, in response to my question—to reduce greenhouse gas emissions is to raise the cost of energy. Are there any ways to reduce these emissions without raising the cost of energy?

I would put this open to anyone who would like to answer.

Mr. ORSZAG. Can I?

Mr. CAMP. Yes.

Mr. ORSZAG. I will just very quickly say prices are part of it. But I also think it's very important—I feel like we need much more psychology 101 in public policy, and maybe a little less economics 101. So, pricing those are important.

But, for example, evidence suggests that for consumers, it's not just the price signal, but even things about—there is this experiment that's been done with a little glowing thing that glows red or green, depending on whether you're more energy intensive or less energy intensive than your neighbors, and that significantly affects behavior. There are lots of interventions that are not direct price signals that can affect what people do.

Mr. CAMP. All right.

Ms. BROWNER. You obviously could use a traditional command and control regulatory scheme. You could set a standard, a pollution standard, a greenhouse gas standard.

The downside of that is you will lose the efficiencies that can come in a trading program. You know, I go back to the acid rain example. Now, acid rain was one pollutant; it was not all sectors of the economy. So, it's not a perfect example.

But the fact that the cost of compliance was so dramatically lower than what even EPA had predicted—the industry costs predictions were much higher than EPA's—I think demonstrates that you will find some efficiencies in a trading regime that you will not find in a traditional command and control regulatory. You could certainly go down that path, but I think it will end up being much more expensive.

Mr. CAMP. Okay. Thank you very much. Thank you, Mr. Chairman.

Chairman RANGEL. The Chair will recognize Mr. Doggett.

Mr. DOGGETT. Thank you very much. I believe that each of you made a contribution to our effort this morning. I particularly took note of Dr. Orszag's comments that the danger, the potential harm to our country that we're facing here can be termed "catastrophic."

There are some people who continue to feel that they can come up with every excuse in the book to avoid doing anything. There are others that, like those on our panel, who have really offered constructive suggestions for how we can improve the cap and trade proposal before the Committee. My focus is on that.

I believe that the Climate Matters bill that we have introduced addresses each of the four critical issues that Mayor Bloomberg talked about. I am pleased to hear you testify that this approach of pollute-free cards, or pollution stamps, that that's a real mistake. That is, despite the significant progress that was made in the Senate this year, the Lieberman-Warner bill tended to favor, a little too heavily. I think we need to tighten up the provisions in Climate Matters on that, and recognize the great cost of using pollution-free permits.

Competitiveness. This is clearly something that we can benefit from, additional input from Mr. Reagan and others, to assure that we're competitive.

Indeed, every alternative idea that has been advanced by my Republican colleagues is in the Climate Matters bill already. It's just that the Climate Matters bill does more than that, and recognizes that it can't be all benefit and no limitation, and that unless you put in place some limit on greenhouse gas pollution, it won't work, and it's never worked in the history of the world, that—if it's all benefit and there is no limitation in the marketplace.

It is true that there may be some additional cost. Now, fortunately, on the one issue that Mr. McCrery offered at the beginning, the concern that all of us have about the rising price of gasoline, fortunately we have a definitive study on what the effect of cap and trade will be on gasoline, and that is from the Bush Administration. They put out an Administration statement during the Lieberman-Warner debate, and they came up with a precise figure.

They tell us that, over the next 20 years, consumers can expect, as a result of a cap and trade system, to have to pay $.03 a gallon more per year over the next 20 years. Well, of course, under the policies of this Administration, many Americans find themselves paying more than $.03 a gallon overnight. I think that's a reasonable price to pay.

The study that was just referenced, from the National Association of Manufacturers, unfortunately is so unrealistic it—in some

of its categories, it's almost 500 percent higher than the Bush Administration on what the effect of cap and trade will be.

So, there are people of good will that want to look at the cost and the benefits. We need to understand that we're not looking at what will be the cost under a cap and trade system versus today. No, we have to weigh the cost of a cap and trade system versus the cost of the do-nothing, catastrophic global warming alternative. That's the proper comparison. That's not—that is what organizations like NAM have not done, to weigh what the alternative costs are.

I would ask Administrator Browner if you would comment on—you currently refer to yourself from your regulatory days, but I believe your current work is advising businesses about how to deal with these issues. What I have noticed is, not only are the States and the cities way ahead of the Congress, but the business community is way ahead of—and they need the certainty now, before they make investment, to know what the rules will be on greenhouse gas emissions. They don't have that.

From your standpoint, as a—from your perspective, not only as a former EPA administrator, but as a business consultant, tell us about what—whether the costs do, in fact—of global warming—pose more problems to business than—in our economy than not—than having a cap and trade system, and tell us about the need for certainty of businesses, and finally, that if we don't act promptly, that each year we delay it becomes a self-fulfilling prophecy, because all you can do then are Draconian costly approaches, rather than having the flexibility if we start immediately.

Ms. BROWNER. First of all, lots of businesses are doing——

Chairman RANGEL. I hate to interrupt, but we do have a problem here. Soon we will have to leave for approximately 30 minutes or more to vote. I am not asking this panel to stay until we come back for questioning.

We have two, four, six, seven Members here now. I am asking unanimous consent that they restrict themselves to 2 minutes. If the vote is delayed, we will come back again and pick up whatever time that we do have. But in view of that, again, I would ask the Members to really expect to get their answers in writing.

At this time I would recognize, on the Republican side, Mr. Weller for 2 minutes.

Mr. WELLER. Thank you, Mr. Chairman, and I will be to the point.

I do want to note my good friend from Texas, my classmate, noted that the price of gasoline in his State would go up about $.03 a gallon based on the Lieberman-Warner bill. Actually, the statement of Administration policy from the White House said it would go up $.53. So, that——

Mr. DOGGETT. Over 20 years, though, Jerry.

Mr. WELLER. So—but you said $.03.

Mr. DOGGETT. It's $.03 per year over that period.

Mr. WELLER. So, Mr. Chairman, I just ask unanimous consent that that statement of Administration policy be inserted into the record at this point, if I could, please.

Chairman RANGEL. The Chair hears no objection.

[The information follows:]

Mr. WELLER. Mr. Chairman, time is limited, and this is an important subject, but I would just note, you know, one of my disappointments this year is, while this is an important hearing, there has been a subject which is so very important in this hemisphere which we have not had a hearing on, and that is the U.S.-Colombia trade promotion agreement.

Of course, Colombia not only is considered the U.S.'s most trusted ally and partner in Latin America——

Chairman RANGEL. We are so limited in time, are you going to connect Colombia with this issue?

Mr. WELLER. Yes. And—but I have 2 minutes, Mr. Chairman, and I do want to be brief.

I just have some copies, some editorials in support of the trade agreement, urging that Congress vote on this trade agreement. I just ask unanimous consent to enter them into the record as well, Mr. Chairman.

Chairman RANGEL. Without objection.

[The information follows:]

Mr. WELLER. Thank you. I just want to comment, Mr. Chairman, that, you know, since this trade agreement was signed by President Uribe and President Bush, that over $1 billion in tariffs have been levied on U.S. products.

Chairman RANGEL. I really don't see, if you know how restricted the time is, how relevant——

Mr. WELLER. Mr. Chairman, out of due respect, I have 2 minutes, and I was just using it as I feel is appropriate.

Now, the economy grew 3.3 percent this last quarter, 90 percent of that growth was based on exports. As we are looking at this coming week, and rushing a stimulus package to the floor without hearings, without action in this Committee, it appears that we are ignoring what has actually proven to grow this economy in the last quarter, which is expanded trade.

That $1 billion in tariffs that was levied on U.S. products, Illinois corn and Illinois soybeans, Illinois-manufactured construction equipment, has cost jobs. This trade agreement was in place, eliminating those tariffs. That's $1 billion worth of products that could have been bought——

Chairman RANGEL. The gentleman's time has expired.

Mr. WELLER. Thank you——

Chairman RANGEL. The Chair would like to recognize Mr. Pomeroy for 2 minutes.

Mr. POMEROY. Mr. Chairman, I would—if trade is on the table, I would certainly like to talk about the catastrophic week we are having on Wall Street as a direct result of this Administration's utter incompetent handling of the economy, but that doesn't have to do with the topic at issue, so I won't mention that. I will get to the issue at hand.

[Laughter.]

Mr. POMEROY. I want to thank you for this hearing, Mr. Chairman, because I believe, as we looked at the environment, and what we're doing relative to this issue, undoubtedly there is one tax strategy discussed after another. This is the jurisdiction of tax policy in this Congress. So, it's going to be vitally important to essen-

tially stake out our jurisdiction. It's going to be central to this issue, and I look forward to working on it.

A couple of speakers have talked about predictability, flexibility, as kind of the central components to this strategy. I would add a third: Viability.

I am anxious, representing 800 years of lignite coal at present usage, that we leap into some regimen that either excludes coal, and therefore doesn't fully contemplate the astounding costs consumers would carry if we somehow diminish the most abundant and affordable energy resource we have in the country. Or, on the other hand, we impose on this fuel source standards that they technologically cannot meet.

I am very interested, but happy to cosponsor the Carbon Reduction Bridge Act, a fee that would be assessed and, on the other hand, would fund research to get us to the point where we're looking at carbon sequestration and other strategies to deal with CO_2 issues and the burning of coal.

The final point I would make is it isn't just about the 800 years of supply we have in North Dakota. The fuel sources of China and India, and much of the developing world, are low-rank coal. When we develop strategies to deal with CO_2 emissions of low-rank coal for our country, we cause the technological breakthrough that's going to allow friends in the other parts of the world that are going to have to be with us on this the very strategies they're going to need, as well.

Thank you, Mr. Chairman, I yield back.

Chairman RANGEL. The distinguished gentleman from Georgia, Mr. Linder, is recognized for 2 minutes.

Mr. LINDER. Thank you, Mr. Chairman. Do any of the four of you question any of the science behind the theory that humans are causing global warming? Anyone want to take a shot at that?

[No response.]

Mr. LINDER. The science is sound? Mr. Orszag, Dr. Orszag, maybe you can tell me. What is the optimum temperature the planet should be at?

Mr. ORSZAG. I cannot give you the optimum temperature. I will relay—and I am not a physical scientist or a climatologist, I'm an economist, but I will relay the professional opinion that the course that we are on involves significant risks, i.e. that the temperature would be higher than we would ideally want it to be—the mean temperature, and that's not even the main concern.

Mr. LINDER. Do you know that the temperature for the last 10 years has been below the temperature average for the last 3,000 years? Are you aware of that?

Mr. ORSZAG. There are fluctuations that occur for a variety of reasons.

Mr. LINDER. Have you seen the petition signed by 31,000 scientists, 9,000 who have Ph.D.'s in the science, 22,000 with masters in science, that take issue with this theory? Have you seen that?

Mr. ORSZAG. I haven't seen that. I would again say on this issue, relative to others, I think there is a stronger and broader consensus among professional scientists than on anything else I have seen.

Mr. LINDER. Well, science is not a democracy.

Mr. ORSZAG. No, it's not.

Mr. LINDER. One of the great deniers of all time was Galileo. So, you have to go by some observations. We can tell you for a fact that the 22 climate models do not accurately reflect observed temperatures. That's been proven.

So, the climate modelers say, "Well, maybe your facts are wrong." Climate modeling is a rather recent science. We're talking about making a huge, huge increase in cost to consumers, based on that theory that no one has ever—a theory. I think we ought to take a look at the science first, and then make our big decision. Thank you.

Chairman RANGEL. Mr. Kind is recognized for 2 minutes.

Mr. KIND. Thank you, Mr. Chairman, and I want to thank the panels for your testimony. I know you have been patient, it's been a long stay already.

But let me just highlight a point of fact that I discovered over the August recess. I took the recess as an opportunity to travel throughout western Wisconsin to visit all the companies that are involved in some form of alternative and renewable energy development, or high efficiency manufacturing products.

I stopped off at a train manufacturing company, which is the largest employer in my district, high efficiency heating and cooling units, asked them what the impact of a cap and trade system in the United States would be, and they said sales would fly off the shelf, and they would be adding jobs to the company.

I visited solar, geothermal, wind companies in the district, too, and asked them the impact of cap and trade on their business. They said they're going to be able to expand, and they're not going to be able to keep up with the orders that would be coming in. So, the point I'm making, then, even with the ongoing controversy with the science behind global warming, a lot of this just makes good business sense for the American economy.

I have read studies—and this is where I want to ask the panel if you have seen studies, too—on the impact of job creation if we moved to an energy-based system with more investment and more reliance on alternative, renewable, clean technology, clean energy sources, as opposed to staying dependant on a carbon-based energy system that we have today.

One study that I showed, it's three to five times more good-paying jobs in the renewable field as we would get in carbon-based production in this country.

Does anyone else have any information? Mr. Orszag.

Mr. ORSZAG. There clearly are sectors that would benefit——

Chairman RANGEL. The response has to be limited to 20 seconds.

Mr. ORSZAG. Yes, it will be really short. Benefit—there are sectors that would benefit. The overall impact, at least in the short run, however, will be some costs. We have to figure out whether we are willing to pay that cost.

Mr. KIND. Okay, thank you.

Chairman RANGEL. The Chair recognizes Mr. Ryan for 2 minutes.

Mr. RYAN. All right, 2 minutes. Did Gary leave, Hufbauer? Did he—okay.

Dr. Orszag, I will stick with you, then. You came to the Budget Committee and went through your report that you released in February, titled, "Policy Options for Reducing CO_2 Emissions," in which you stated that when targeting long-term reductions and greenhouse gas emissions, "A tax could be set at a rate that could meet that target, and at a lower cost than a comparable cap."

I—this was a very good report, by the way, I encourage people to read this. Specifically, you reported that the net benefits of a tax could be roughly five times greater than the net benefits of an inflexible cap. Let's put aside the arguments of the science for a second, and just think about this from the purpose of economics.

Is it—given that cap and trade gives us a theoretical certainty of reductions, never mind the fact that those might not be achieved, isn't a tax far more economically efficient, with respect to job displacement and competitiveness, given that you can border adjust taxes, than a cap and trade regime?

Mr. ORSZAG. Yes. A simple cap and trade regime. You can make cap and trade more similar, or increase its efficiency through things like banking and borrowing, or price—a ceiling, floor on prices.

Mr. RYAN. The more we complicate things, I would argue—and I am watching my clock, Chairman—and I wanted to ask Gary, but—we can invite all these WTO problems through the cap and trade approach.

The fear that I have is—you know, I don't like the cap and trade bill at all, but the fear I have is we're going to set up a revenue spending machine up here. One point two trillion dollars, I think, is your 10-year score of Warner-Lieberman, which is the revenues that come here, and we're going to reallocate that in Washington? Take that out of the economy?

It is best if we leave all of this back in the economy. From an economics standpoint, if we're going to do this—which, I caution against it—if we're going to do this, keeping it in the economy through the tax system, we don't have the WTO problems, we don't have the economic dislocation problem, and yet we still send the kinds of price signals against carbon that people want to send.

My time is up. Thank you, Chairman.

Chairman RANGEL. Mr. Pascrell.

Mr. PASCRELL. Thank you, Mr. Chairman. Mr. Chairman, I've been a long critic of many of the trade agreements, and I'm sorry Mr. Hufbauer had to leave. There are certain countries I anticipate will attempt to bypass our greenhouse emission regulations. The fact is that when countries who are also guilty of contributing high quantities of greenhouse emissions are allowed to skirt the rules, the impact is felt back here at home.

How do we level the field, internationally? The large emitting countries like China and India, they're also under domestic and international pressures. The United States might better address competitiveness concerns by actively engaging in international negotiations.

Here is my question to anyone on the panel. Knowing that China, India, and Brazil are not signatories and operate without any regulation of greenhouse gas emissions for the most part, what's your stance on the imposition of a safety valve on the price

per ton of carbon to ensure that American manufacturing remains globally competitive?

Who would like to take a shot at that? Dr. Burtraw.

Mr. BURTRAW. The introduction of a safety valve which serves as a price ceiling is probably one of the most important mechanisms to manage potential cost and cost disruptions from cap and trade programs.

But it has been also quite criticized, because the way it has been suggested in previous legislation, it would be immediately binding. It would, essentially, determine the price. It provides a sort of a disincentive for investment in new technologies.

So, a much preferable approach would be—as Dr. Orszag mentioned earlier—would be a ceiling, as well as a floor; a floor, simply taking the form of a reserve price in an auction. That way, if prices were to fall, as occurred in the EU, for example, and this is a part of the REGI auction that's occurring, the regional greenhouse gas——

Mr. PASCRELL. How do you think——

Mr. BURTRAW. Those allowances are not put into the market. That brings back up the price of allowances——

Mr. PASCRELL. Just quickly, how do you think this is going to affect our trade negotiations with other countries, if this—if we're trying to level the field at the same time?

Let's say we have a ceiling, let's say we have a floor. How do we do that?

Mr. BURTRAW. No, you're right. The EU has been very concerned about the possibility that the U.S. would introduce a safety valve, because they do not have one in their program.

But instead, what they do is administratively adjust their program on a—revisiting it in different phases. So, they have a safety valve of their own, you just see it behind closed doors.

Mr. PASCRELL. Thank you.

Chairman RANGEL. The Chair recognizes Mr. Nunes. He's not here? Mr. Tiberi.

Mr. TIBERI. Thank you, Mr. Chairman. My congressional district over the last 8 months has lost five manufacturers who have announced that they are leaving central Ohio. Three are moving to other States in the United States, and two are moving to countries that have no emission requirements and don't plan to.

The question to the three of you—and, Tim, I will start with you—is isn't a better way of going about this to protect our manufacturing? One analysis in our State of Ohio is that by 2030 we will lose 140,000 manufacturing jobs, we will have none left. Isn't a better way of doing this creating incentives for manufacturers, in terms of a playing field, to reduce emissions?

Mr. REGAN. I think that's why I was leaning toward this notion of some sort of an allowance system that would give energy-intensive manufactures assistance to try to deal with the problems associated with the costs we have to absorb, and our inability to pass them on.

Mr. TIBERI. Thank you.

Mr. REGAN. So, that's where I am.

Mr. TIBERI. Go ahead.

Mr. BURTRAW. No, I agree. Exactly. That's correct. I think it's a major concern, but I think——

Mr. LIGHTHIZER. Well, I agree it's a major concern also, and I think it's one of the reasons why you have to look at the competitiveness side of this so closely.

Because the fact is, we're going to exacerbate that trend that's going on right now if we don't make sure that people in China and other places that are bringing products to the United States bear the same burden that we do on the cost of carbon.

Mr. TIBERI. Thank you. I yield back, Mr. Chairman.

Chairman RANGEL. The Chairman recognizes the gentleman from Alabama, Mr. Davis.

Mr. DAVIS. Thank you, Mr. Chairman. Given the time constraints, I am going to use my 2 minutes in making an observation, and then invite a very quick response from perhaps one of you all.

This is the concern that I have, was I want to make sure that I underscore that the concerns about cap and trade are, frankly, not divided along party lines. You know, someone casually listening to this hearing might assume that Republicans are in one place, and Democrats are in another.

While I don't endorse Mr. Lender's comments about the science, I would endorse some of the comments that have been made on the other side of the aisle about the impacts of cap and trade. Let me briefly summarize them.

I have three sets of concerns. One concern is because we know that particular industries are going to be disadvantaged—steel, heavy duty manufacturing, pulp and paper, forestry—we can predict that those kinds of industries will be disproportionately disadvantaged, well, that means two things.

First of all, those industries, of course, are not spread evenly across the country. They are disproportionately located in the American South and the American Midwest.

Another thing that we know is that those particular industries have all borne the brunt of a lot of changes we have had in global markets in the last decade. We know that all those industries are affected by anti-competitive conduct abroad from the Chinese and others.

Third of all, we know that, frankly, those kinds of heavy duty manufacturing industries have been the traditional conveyor belt for people who may not be college educated, but who want to earn a middle-class income.

I have another set of concerns within those. My State is a classic example of one that has two economies. There is a part of Alabama that is a modern information technology, financial services, health care-driven economy that, frankly, doesn't care a whole lot about this debate. But there is another part of it that is conventional, heavy duty manufacturing, automobiles, forestry, pulp and paper.

I am concerned that if we're not careful about the way we do this, we will get more segmentation of the economy in States like Alabama, more parts of the State faring poorly because of these changes, other parts of the State unaffected.

Mr. Lighthizer, can you speak to this concern about, if we do this wrong, our driving and creating more wage inequality in this economy and more class inequality in this economy?

Mr. LIGHTHIZER. Yes, I would be happy to. I think the sense of my testimony was that we really have to get this part of it right. If we don't, there are enormous amounts of problems that we're going to create. One of them is this problem that you alluded to, which is that we are going in the direction of having—we are getting rid of all the conveyor belts to middle-class status for people, and we're going to find ourselves losing the kind of good, middle-class jobs that we need in this country.

I think it is possible to get it right. But, candidly, most of the proposals out there need some change. But I think it's a fundamental problem.

The first question really is what Mr. Levin asked, which is, "Do we have a problem?" If you agree with that, then, in my judgement at least, yours is the most important second problem. Can we do this in a way that doesn't really alter our economy and our society, ultimately, in a negative way?

Chairman RANGEL. Well, Mr. Davis, you certainly were timely.

Let me tell this panel that we recognize that we have not come anywhere close to resolving this problem. But I do hope that when we do start next year, you will make yourselves available in a more informal manner, where you're not restricted to 5 minutes, but you will be able to share with us and compete in your thinking, so that we can make the best possible decision for our country, and indeed, the planet.

I want to thank you for your patience with us. We thank this panel.

For the next panel, we will be on the floor for at least a half-hour. We recognize you haven't had a chance to eat. So, if we can reconvene at 2:15, I think that could fit in as to what we would like to do here.

So, thank you so much for your patience with us, but we are controlled by the votes on the floor. We stand in recess.

[Recess.]

Chairman RANGEL. Here again, let me say publicly what I have said to you privately. The awkwardness of our parliamentary system causes us to have to leave the hearing rooms to vote, because that's what we're here for.

But I want to assure you that this problem is so complex, that when the Committee—assuming we can convince the new President to give us the priority which we on the Committee believes this deserves—I was telling them earlier that this room will be converted into a room with Members, Republican and Democrat, sitting with you as we walk through this, so that at the end of the day, you won't have to ask what's in the bill, and to see whether you can support it.

We need your support, your expertise to be out there, Republicans and Democrats, to say not what's good for our party, but what's good for our country, and what's good for the planet. So, we are going to take advantage of the expertise, but also to give you the opportunity, not just to say what we should be doing, but to be a part of putting it together.

I really believe that next year we can start brand new initiatives, things expire, and we can really be proud and lucky that we are participants in it.

So, Mr. Ackerman, thank you so much, and all of you, for your patience. We will start with your testimony as the Members come in. Thank you, I knew you would be here.

STATEMENT OF FRANK ACKERMAN, PH.D., GLOBAL DEVELOPMENT AND ENVIRONMENTAL INSTITUTE AND STOCKHOLM ENVIRONMENT INSTITUTE—U.S. CENTER, TUFTS UNIVERSITY, MEDFORD, MASSACHUSETTS

Mr. ACKERMAN. Thank you, Mr. Chairman, and Members of the Committee, for inviting me here to testify on this important topic.

The issue of climate change is particularly timely now, because there has been a shift away from a debate about the science. The world has, essentially, decided about the science at this point. As the science debate is reaching closure, the economics debate is still wide open.

Climate change is happening. It is threatening our future well-being. But how much can we afford to do about it? The most powerful argument for inaction today is that the cost of reducing emissions would somehow be intolerable. The damage to the economy, it is alleged, would be worse than the problem we are trying to solve.

This argument, I believe, is wrong on two counts. It exaggerates the cost of reducing emissions, and it understates the harm that will occur if we continue to do little or nothing about the problem. That second point is what I'm mainly going to talk about.

But briefly, on the first point, on the cost of reducing emissions, the two best studies I have seen, Nicholas Stern's very detailed study for the British government, and the recent studies by McKinsey and Company, the international consulting firm that has been studying it, both estimate that what we need to spend, total package worldwide, is about 1 percent of world output for quite a few years, for some decades to come, in order to reduce emissions to a safe level.

Without having researched it myself, I take that as a good estimate. My research says that the cost of inaction for the United States, where we have just a partial estimate, are going to be much greater than that.

We estimated just four categories of the cost of inaction, the cost of increased hurricane damages as hurricanes become more intense as water and air get warmer, the cost of sea level rise, as the seas rise and threaten more coastal properties, the increased energy system costs, as increased air conditioning costs rise rapidly throughout the country, only partially offset by reduced heating costs in the northern States. Finally, the huge costs of water supply, as hotter and dryer conditions in the already dry States of the south and southwest cause huge new costs to maintain water supply, likely losses to irrigated agriculture, and so forth.

These four categories, this partial estimate of the cost of inaction, is already above 1 percent of GDP at the beginning of the century, rises to 1.5 percent of GDP by the end of the century, and will keep on rising beyond that.

I would emphasize that it's a very partial account. There are many other categories: health costs, agriculture costs, losses of

tourism and so forth, which are not included in that, which would make the true numbers even larger.

I will briefly mention two other studies of the cost of inaction we did. We did one looking at Florida, in specific, one of the States that is most vulnerable, where all of these costs loom much larger, the expected losses of tourism revenue as the conditions that draw people to Florida now are undermined really cuts a hole in the economy that the losses to Florida could exceed 5 percent of that State's income by the end of the century—again, for a very partial accounting of the costs—and continue rising.

The data allowed us to map what would be the effects of 27 inches of sea level rise in Florida. The written testimony describes that, shows a map, 9 percent of the State, 1.5 million people's homes under water at high tide by about 2060, huge number of facilities and property lost.

Finally, we did a study of some of the Caribbean islands, some of the parts of the world that are much more sensitive even than the most sensitive States, like Florida. Huge losses, some economies likely to be wiped out by hurricane damages, losses of tourism, and so forth.

This is not only a humanitarian issue for us, this is a likely source of a huge increased flood of refugees. If you are driven out of your home in the Caribbean by increasingly stormy and difficult conditions that have destroyed your local economy, where are you going to move to that's a little colder and a little richer? My guess is they are coming here.

So, the climate change, for all of those reasons, for the flood of refugees it could create, for the costs, the ones I have been able to enumerate, which are large enough, as well as the many others that I have not enumerated, the costs of inaction, even a partial accounting of the cost of inaction, is much greater than the cost of action, and will continue to rise into the future.

These costs are detailed in the testimony which contains links to the original studies. We are not just talking about numbers getting larger as the economy grows. These are expressed as percentages of the economy. So, it is that the economy will be growing throughout the century, the damages from climate change will be growing even faster, they will be growing to be a larger and larger percentage. If we do nothing about it, they will continue to get worse, as time goes on.

As other witnesses have said, doing something about climate change is expensive. Doing nothing about it is much more expensive. It's not too hard to pick which one to choose.

[The prepared statement of Mr. Ackerman follows:]

Climate Change: The Costs of Inaction

Testimony presented to
United States Congress
House Committee on Ways and Means
Hearing on "Preventing Climate Change"
September 18, 2008

Dr. Frank Ackerman
Stockholm Environment Institute-US Center
Tufts University
Medford, Massachusetts

Mr. Chairman and members of the committee,

Thank you for the invitation to testify on my research on the costs of climate change. This hearing comes at a crucial juncture – and not only because a new administration, of either party, is likely to make changes in US climate policies. New initiatives are on the table, in part, because there has been a fundamental shift in the terms of the debate, with the focus of controversy moving from science to economics. In the realm of science, the influence of the climate skeptics is rapidly waning; the world's scientists have never been so unanimous, and so ominous, in their warnings of future hazards.

While the climate *science* debate is approaching closure, the climate *economics* debate is still wide open. Climate change is happening, it is threatening our future well-being – but how much can we afford to do about it? The most powerful argument for inaction today is no longer skepticism about the science, but rather the claim that the costs of reducing emissions would be intolerable. The damage to the economy, it is alleged, would be worse than the climate problem we are attempting to solve.

The economic argument for inaction is wrong on two counts: it exaggerates the costs of reducing emissions, and it understates the harm that will occur if we continue to do little or nothing about climate change. My testimony primarily addresses the second point, on the costs of inaction.

On the first point, the costs of reducing emissions, Nicholas Stern's detailed review of the economics of climate change, for the British government, estimated that we need to spend about one percent of global income for several decades to bring carbon dioxide emissions down to a relatively safe level. More recent studies of the costs of carbon reduction technologies, by McKinsey & Company, an international consulting firm, have led to very similar estimates. The occasional claims of much higher costs are not nearly as well researched and documented as the Stern and McKinsey estimates. Thus I believe that one percent of global income is the best available estimate of the cost of solving the climate problem.

In contrast, my research shows that for the United States as a whole, even a partial accounting of the costs of *inaction* exceeds one percent of GDP, and rises steadily over time. For some parts of the country, such as Florida, a similar, partial accounting of the costs of inaction could reach 5 percent of state income within this century. For particularly vulnerable parts of the world, such as the islands of the Caribbean, the costs will be disastrously greater – with one likely consequence being a much-increased flow of refugees out of that region.

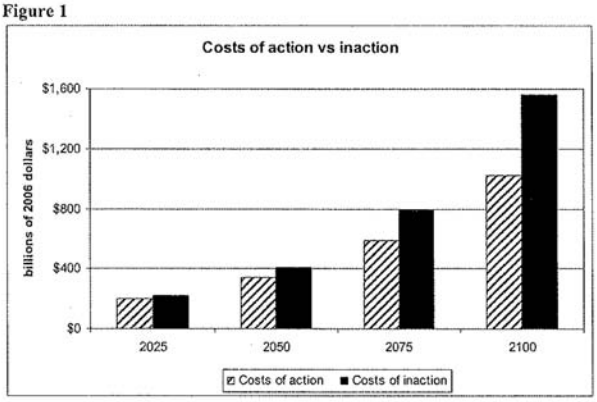
Damages that will result from inaction include (but are not limited to):

- the impacts of increasingly severe hurricanes

- more coastal property at risk from rising sea levels and storm surges
- increased energy costs for air conditioning as temperatures rise
- growing scarcity and rising costs for water
- losses in agriculture due to hotter and drier conditions
- losses of tourism revenue as weather conditions worsen

A graphic comparison of the annual costs of action (one percent of GDP) versus my partial accounting of the annual costs of inaction is shown in Figure 1. There are real costs to reducing emissions; there are much worse, bigger costs to doing nothing. And my analysis includes only a part of the benefits of taking action to reduce emissions. If we reduce oil consumption by using more fuel-efficient vehicles, the price of gasoline will be lower; this important point is not included in my research.

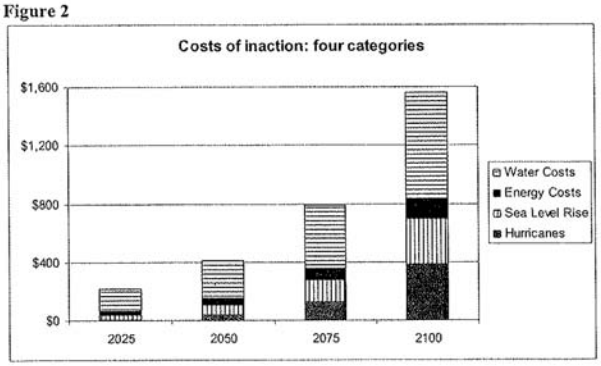
Figure 1



The principal categories of costs of inaction that are estimated in my research are shown in Figure 2 below, and described in my detailed testimony.

The farther we look into the future, the worse that the costs of inaction will become. The longer we do nothing, the greater the risks of an irreversible climate catastrophe, such as a massive rise in sea levels, that could make the world unable to support anything like the current levels of population and economic activity. The costs and risks of inaction are overwhelmingly worse than the moderate and manageable costs of an immediate effort to reduce carbon emissions.

Figure 2



My detailed testimony draws on studies done at the Stockholm Environment Institute-US Center, a research center at Tufts University, in which I have collaborated with another economist, Dr. Elizabeth A. Stanton, as well as Ramón Bueno and Cornelia Herzfeld. For more information on our research on climate economics, please see http://www.sei-us.org/climate-and-energy/climate-economics.html . This website includes links to the studies of the costs of inaction for the US as a whole[1], for Florida[2], and for the Caribbean region[3], which together form the basis for my testimony today.

I will be happy to provide any additional information related to this testimony, and to answer any questions that you may have about it.

Sincerely,

Dr. Frank Ackerman

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[1] Frank Ackerman and Elizabeth A. Stanton, *The Cost of Climate Change: What We'll Pay if Global Warming Continues Unchecked*, May 2008, http://www.nrdc.org/globalwarming/cost/contents.asp. See also the more technical supporting document, Ackerman and Stanton, *Climate Change and the U.S. Economy: The Costs of Inaction*, May 2008, http://www.sei-us.org/climate-and-energy/US_Costs_of_Inaction.doc.
[2] Elizabeth A. Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, November 2007, http://www.sei-us.org/climate-and-energy/Florida_Inaction_Cost.html.
[3] Ramón Bueno, Cornelia Herzfeld, Elizabeth A. Stanton, and Frank Ackerman, *The Caribbean and Climate Change: The Costs of Inaction*, May 2008, http://www.sei-us.org/climate-and-energy/Caribbean_Inaction_Cost.htm.

Introduction: The Costs of Inaction

A scientific consensus has been reached: The earth's climate is changing for the worse, as a result of anthropogenic (human-caused) changes to the composition of the atmosphere. If we work together, all around the world, to reduce the concentration of greenhouse gases in our atmosphere, we can slow and even stop climate change. If we fail to do so, the consequences will be increasingly painful – and expensive.

Our analyses compare the economic consequences of two possible climate futures: The *business-as-usual* case, the worst likely result of emissions that continue to increase over time, unchecked by public policy, and the *rapid stabilization* case, the best likely result of a program of rapid, ambitious worldwide abatement initiatives.[4] It is too late to avoid all climate damages; even the rapid stabilization case involves significant losses due to climate change. However, the difference between the two scenarios – between the comparatively small losses under rapid stabilization and the huge losses under business-as-usual – is avoidable if we act soon.[5] Failure to act means that we will incur a much bigger and more painful climate loss rather than a smaller and more bearable one. The difference between the two is the cost of inaction.

My testimony begins with our analysis of the costs of inaction for the U.S., and then turns to our findings for Florida and for the Caribbean. A brief conclusion summarizes the message and the meaning of this testimony for climate policy decisions.

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[4] On many climate projections, the IPCC issues a range of possible forecasts, with estimates of probabilities attached. Here we differ from the simple approach of reporting the median of the IPCC range. Since the future will only happen once, and we want to know how bad the risks of future damages could be, the median is misleading: there is a 50-50 chance that the future will be worse than that, perhaps much worse. Instead, we use the upper (worst) limit of what IPCC calls the "likely" range of outcomes – which they define to mean the 17th to the 83rd percentiles. That is, we report the 83rd percentile of IPCC forecasts, generally using their rapidly growing A2 scenario to represent business as usual. Using similar logic, our best case or rapid stabilization scenario represents the 17th percentile outcome of the more slowly growing B1 scenario – or as good as it is likely to get, according to IPCC projections. Note that IPCC projects a one-in-six chance that the worst case is worse, and the same odds that the best case is better, than our estimates.

[5] Throughout our analyses we assume that the size of the economy and population will be the same in both scenarios. This (perhaps unrealistic) assumption is useful in clarifying the meaning of our two cases, and the contrast between them: all the economic differences between the business-as-usual and rapid stabilization cases reflect different climate impacts applied to the same economy, not changes in the underlying projections of output or population.

U.S. Costs of Inaction: Business-As-Usual Scenario

In the business-as-usual case, the average annual temperature in most of the mainland 48 states will increase 12 to 13°F by 2100 – a little more in the nation's interior, a little less on the coasts. For a few areas of the country, the average annual temperature increase will be near or below the global mean: for the Gulf Coast and Florida, 10°F; and for Hawaii and U.S. territories in the Pacific and the Caribbean, 7°F by 2100. Alaska, like all of the Arctic, will experience an even greater increase in average temperature than the U.S. mainland. On average, Alaska's annual temperature will increase by a remarkable 18°F by 2100, but temperature increases may be even higher in the northernmost reaches of Alaska. Table1 shows the progression of these temperature changes over time.

Table 1: Business-As-Usual Case: U.S. Annual Average Temperatures by Region

in degrees Fahrenheit above year 2000 temperature

	2025	2050	2075	2100
Alaska	4.4	8.8	13.2	17.6
U.S. Central	3.3	6.6	9.9	13.1
U.S. East	3.1	6.1	9.2	12.2
U.S. West	3.1	6.1	9.2	12.2
U.S. Gulf Coast and Florida	2.4	4.9	7.3	9.7
Global Mean	2.2	4.3	6.5	8.6
Hawaii and the Pacific	1.8	3.6	5.4	7.2
Puerto Rico and the Caribbean	1.8	3.6	5.4	7.2

These temperature increases represent a fundamental change to the climate of the United States. In the business-as-usual case, the predicted annual average temperature for Anchorage, Alaska in 2100 – 53°F – is the historical annual average temperature for New York City. Under this scenario, the northern tier of mainland states from Washington to Maine will come to have the current climate of the mid-latitude states, those stretching from Northern California to New Jersey. Those middle tier states will take on the climate of the southern states, while the southern states will become more like Mexico and Central America. Annual average temperatures in Honolulu and Phoenix will match some of the hottest cities in the world today – Acapulco, Mexico and Bangkok, Thailand. The United States' hottest big cities, Miami and San Juan, Puerto Rico, will reach annual averages of 85 and 87°F, respectively – hotter than any major city in the world today.

Changes in precipitation patterns are likely to differ for each region of the United States. Alaska's precipitation will increase by 10 to 20 percent, mostly from increased snowfall.

The Great Lakes and Northeast states will receive 5 percent more precipitation each year, mostly in winter. The U.S. Southwest, including California and Texas, will experience a decrease in precipitation, down 5 to 15 percent, mostly from less winter rain. The U.S. Gulf Coast and Florida will also receive 5 to 10 percent less rain each year. There will also be a higher risk of winter flooding, earlier peak river flows for snow and glacier-fed streams; lower summer soil moisture and river flows; and a shrinkage of sea ice, glaciers and permafrost. Climate change also affects storm intensity; specifically, Atlantic hurricanes and Pacific typhoons will become more destructive.

Our estimates for sea-level rise under the business-as-usual case diverge somewhat from the scenarios presented in the latest IPCC report. This area of climate science has been developing rapidly, but the most recent advances were released too late for inclusion in the IPCC process. Based on our reading of this recent work, we use an estimate of 45 inches by 2100.[6]

We consider four case studies of the economic consequences of climate change under the business-as-usual climate scenario for the United States:

1) increasing intensity of Atlantic and Gulf Coast hurricanes
2) inundation of coastal residential real estate with sea-level rise
3) changing patterns of energy supply and consumption
4) changing patterns of water supply and use, including effects on agriculture

These are far from the only consequences of climate change; the costs in these four areas are only a partial accounting of the economic damage that will result from business as usual. Nonetheless, costs in these four areas will, if present trends continue, amount to $1.8 trillion (in today's dollars), or 1.8 percent of U.S. output per year by 2100 in the business-as-usual case. Once the smaller, unavoidable costs under the rapid stabilization case (discussed below) are subtracted, the "cost of inaction" or the difference between the business-as-usual and rapid stabilization cases could be more than $1.5 trillion or 1.5 percent of U.S. output *per year* by 2100.

Hurricane damages. In the business-as-usual scenario, hurricane intensity will increase, with more of the most intense types of hurricanes occurring as sea-surface temperatures rise. Greater damages from more intense storms would come on top of the more severe storm surges that will result from higher sea levels. We consider three factors that are expected to increase damages and deaths resulting from future hurricanes; each of these three factors is independent of the other two. The first is coastal development and population growth – the more property and people that are in the path of a hurricane, the

[6] For details, see Frank Ackerman and Elizabeth A. Stanton, *Climate Change and the U.S. Economy: The Costs of Inaction*, pp.7-8, http://www.sei-us.org/climate-and-energy/US_Costs_of_Inaction.doc.

higher the damages and deaths. Second, as sea levels rise, even with the intensity of storms remaining stable, the same hurricane results in greater damages and deaths from storm surges, flooding, and erosion. Third, hurricane intensity may increase as sea-surface temperatures rise. Combining these effects together, the predicted increase to U.S. hurricane damages for the year 2100 is $397 billion, or 0.39 percent of U.S. output in the business-as-usual case.[7]

Rising sea levels. The effects of climate change will have severe consequences for low-lying U.S. coastal real estate. If nothing were done to hold back rising waters, sea-level rise would simply inundate many properties in low-lying, coastal areas. Even those properties that remained above water would be more likely to sustain storm damage, as encroachment of the sea allows storm surges to reach inland areas that were not previously affected. In the business-as-usual case, the annual residential real estate losses in the 48 mainland states rise to $360 billion or 0.35 percent of U.S. output by 2100. No one expects coastal property owners to wait passively for these damages to occur; those who can afford to do so will undoubtedly seek to protect their properties. But all the available methods for protection against sea-level rise are problematical and expensive. It is difficult to imagine any of them being used on a large enough scale to shelter all low-lying U.S. coastal lands from the rising seas of the 21st century.

Energy demand. Climate change will affect both the demand for and the supply of energy: hotter temperatures will mean more air conditioning and less heating for consumers – and more difficult and expensive operating conditions for electric power plants. In the business-as-usual case, increasing average temperatures drive up the costs of electricity above population and per-capita increases. Not surprisingly, electricity demand rises most rapidly in the Southeast and Southwest, as those regions experience more uncomfortably hot days. By the same token, our model projects that while the Northeast and Midwest also have rising air conditioning costs, those costs are largely offset by reduced demand for natural gas and heating oil expenditures. That is, speaking very roughly, the colder half of the country nearly breaks even on energy costs, experiencing reduced heating and increased air conditioning costs of the same magnitude. The warmer half of the country, where heating costs are already small, suffers a substantial net increase in energy costs due to rising air conditioning use.

Overall costs in the energy sector in the business-as-usual case, combining increased costs for electricity and for new air conditioners, net of decreases in heating fuel costs, add up to $141 billion per year by 2100, or 0.14 percent of projected U.S. output.

[7] These numbers represent a 6 percent reduction from our previously reported hurricane damage estimates, to correct a technical error in the original numbers that led to a 6 percent overestimate, pointed out by Roger Pielke Jr. (personal correspondence).

Water supply. In the business-as-usual future, problems of water supply will become more serious, as much hotter and in many areas drier conditions will increase demand. The average temperature increase of 12-13°F across most of the country, and the decrease in precipitation across the South and Southwest, as described above, will lead to water scarcity and increased costs in much of the country. Responses are likely to include intensified water conservation measures, improved treatment and recycling of wastewater, construction and upgrading of cooling towers to reduce power plant water needs, and a reduction in the extent of irrigated agriculture. Extrapolating from the best available past research, we find that the costs of business-as-usual for water supply could reach $950 billion per year by 2100, while the anticipated gains in crop yields may be small, and would in any case vanish by mid-century.

The annual costs of these four effects alone adds up to $1.8 trillion in 2100 or 1.8 percent of U.S. output in the business-as-usual scenario, as summarized in Table 3 below. The total cost of these four types of damages, however, only represents a lower limit on the total cost of the business-as-usual scenario; many other kinds of damages, while also likely to have important effects on the U.S. economy, are more difficult to estimate. Damage to commercial real estate from inundation, damage to or obsolesce of public and private infrastructure from rapidly changing temperatures, and losses to regional tourism industries as the best summer and winter vacation climates migrate north – just to name a few – are all likely effects of climate change that may be costly in the United States. Effects on human health, natural environments, and endangered species add other important climate damages, which are difficult or impossible to price.

U.S. Costs of Inaction: Rapid Stabilization Scenario

With immediate, large-scale reductions in greenhouse gas emissions, it is still possible for changes in the world's climate to remain relatively small. The rapid stabilization case is an optimistic estimate of the impacts of the most rigorous policy prescription under discussion today: "80 by 2050", or an 80 percent reduction in U.S. emissions by 2050, accompanied by a 50 percent reduction in total world emissions and continuing reductions thereafter. By 2100 in the rapid stabilization case, U.S. temperatures rise by 2 to 4°F (see Table 2) and sea levels rise 7 inches, but precipitation levels and other climatic trends remain at their historical levels.

Table 2: Rapid Stabilization Case: U.S. Annual Average Temperatures by Region

in degrees Fahrenheit above year 2000 temperature

	2025	2050	2075	2100
Alaska	0.9	1.8	2.8	3.7
U.S. Central	0.8	1.5	2.3	3.0
U.S. East	0.7	1.4	2.2	2.9
U.S. West	0.7	1.4	2.2	2.9
U.S. Gulf Coast and Florida	0.6	1.1	1.7	2.2
Global Mean	0.4	0.9	1.3	1.8
Hawaii and the Pacific	0.4	0.8	1.2	1.6
Puerto Rico and the Caribbean	0.4	0.8	1.2	1.6

A small change in annual average temperatures can mean a big difference to a local climate. For example, the historical average annual temperature is 50°F in Boston, 53°F in New York City, and 56°F in Washington D.C. The rapid stabilization scenario still represents a significant change to local climates throughout the United States in the next century. Three degrees Fahrenheit is a big change, but if it happens at a slow enough pace, each locality should be able to adapt to its new climate. Of course, this adaptation will not be costless.

The area of the United States that will suffer the most extreme impacts, even in the rapid stabilization case, is Alaska, where glaciers, sea ice, and permafrost are already retreating today, and an even greater upheaval to ecosystems, infrastructure, and industry can be expected in the decades to come. U.S. Gulf States, Florida, Hawaii, and U.S. territories in the Pacific and the Caribbean, in contrast, will experience smaller temperature changes – much closer to the global mean – than the majority of U.S. states. On the other hand, island and coastal regions are more exposed than the interior of the country to other aspects of climate change, such as increased storm damages and sea-level rise.

Hurricane damages. In the rapid stabilization case, hurricane damages will be only slightly worse than current conditions. U.S. hurricane damages for the rapid stabilization case are projected to be $12 billion per year by 2100, over and above current average damages.

Rising sea levels. In the rapid stabilization case, we assume that the value of U.S. coastal real estate has grown in proportion to GDP, and that annual damages will be proportional to sea level and to GDP. Using the projected 7 inches of sea-level rise by 2100, residential real estate losses from inundation rise to $46 billion annually by 2100.

Energy demand. The milder changes in climate under the rapid stabilization scenario lead to modest net increases in energy costs, amounting to $8 billion by 2100.

Water use. As temperatures rise, more water will be needed for irrigation, power plant cooling, household needs, and other uses. Moreover, a higher air temperature leads to faster evaporation; this could outweigh the gains from moderate increases in rainfall in some areas, leaving a smaller amount of water available in rivers and reservoirs. The water sector costs for the rapid stabilization case reach $220 billion in 2100; this is an important cost, but still far below the economic burden for water supply under business as usual.

In the rapid stabilization scenario the annual costs of these four effects alone adds up to $287 billion in 2100, or 0.28 percent of U.S. output, as summarized in Table 3 below.

U.S. Costs of Inaction: Summary

How much can we reduce these climate-induced losses by limiting our emissions of greenhouse gases? It is, unfortunately, no longer possible to avoid all adverse climate impacts. Some change from the pre-industrial climate has already taken place, and more is bound to occur as a result of greenhouse gases in the atmosphere, as well as the additional emissions that will be released in the very near future (too soon for policy changes to take effect).

The cost of inaction is the difference between the estimates for the business-as-usual and rapid stabilization cases, summarized in Table 3. The annual cost of inaction – the difference between the two cases – reaches $1.56 trillion, or 1.53 percent of U.S. output by 2100. And there are many other categories of costs that will be imposed by climate change, beyond the four areas we have examined; the total cost of inaction is inevitably much greater.

The costs we have estimated are not evenly distributed throughout the country. Hurricane damages are experienced almost entirely in the southeastern coastal states, on the Gulf Coast and the Atlantic (Pacific storms that affect Hawaii and the West Coast are not included in this calculation). Sea-level rise, of course, affects coastal areas. Energy costs are heavily concentrated in southern states; many northern states would enjoy reductions in winter heating costs that are roughly comparable to increased summer electricity expenses. Water supply costs are concentrated in areas that become drier than at present, particularly the Southeast and Southwest. Costs experienced in Alaska and Hawaii, and in Puerto Rico and other territories, are almost entirely omitted from these calculations. Moreover, the problem of climate change will not end at 2100. Under business as usual, the costs of inaction will continue to mount, more and more rapidly, as time goes on.

With rising temperatures there will also be an ever-increasing probability of catastrophic change, far worse than our estimates of non-catastrophic damages. Collapse of the Greenland ice sheet would lead to sea-level rise of more than 20 feet, destroying coastal communities, industries, and infrastructure everywhere; collapse of the West Antarctic ice sheet would be of a similar magnitude. No one knows exactly at what point this would happen – but everyone knows that ice melts faster as it gets warmer.

In short, the estimates in Table 3 are a very partial accounting for the costs of inaction on climate change. The total costs are uncertain in detail, but are sure to be larger than our estimates.

Table 3: Costs of Inaction for Four Categories of Damages for the U.S.

	in billions of 2006 dollars				*as a percentage of GDP*			
	2025	**2050**	**2075**	**2100**	**2025**	**2050**	**2075**	**2100**
Hurricane Damages								
Business-as-Usual	$9	$40	$133	$397	0.05%	0.12%	0.22%	0.39%
Rapid Stabilization	$1	$2	$5	$12	0.00%	0.01%	0.01%	0.01%
Cost of Inaction	**$9**	**$38**	**$128**	**$385**	**0.04%**	**0.11%**	**0.22%**	**0.38%**
Real Estate Losses								
Business-as-Usual	$34	$80	$173	$360	0.17%	0.23%	0.29%	0.35%
Rapid Stabilization	$4	$10	$22	$46	0.02%	0.03%	0.04%	0.05%
Cost of Inaction	**$30**	**$69**	**$151**	**$314**	**0.15%**	**0.20%**	**0.25%**	**0.31%**
Energy Sector Costs								
Business-as-Usual	$28	$47	$82	$141	0.14%	0.14%	0.14%	0.14%
Rapid Stabilization	$2	$3	$5	$8	0.01%	0.01%	0.01%	0.01%
Cost of Inaction	**$26**	**$45**	**$77**	**$133**	**0.13%**	**0.13%**	**0.13%**	**0.13%**
Water Costs								
Business-as-Usual	$200	$336	$565	$950	1.00%	0.98%	0.95%	0.93%
Rapid Stabilization	$46	$78	$131	$220	0.23%	0.23%	0.22%	0.22%
Cost of Inaction	**$154**	**$258**	**$434**	**$729**	**0.77%**	**0.75%**	**0.73%**	**0.71%**
Total Costs for Four Categories								
Business-as-Usual	$271	$503	$953	$1,847	1.36%	1.46%	1.61%	1.81%
Rapid Stabilization	$53	$93	$163	$287	0.27%	0.27%	0.28%	0.28%
Cost of Inaction	**$218**	**$410**	**$790**	**$1,561**	**1.09%**	**1.19%**	**1.33%**	**1.53%**

Florida: Higher Risks, Higher Costs

The costs of climate change, measured as a share of GDP, are lower for the U.S. than the world as a whole. This is because the U.S. is colder than many parts of the world, is better supplied with fresh water, and has an unusually large percentage of population and economic activity in the interior of the country, far from the coastal damages caused by hurricanes and sea-level rise. Yet the U.S., of course, is large and varied; in hotter, water-stressed, and coastal states, nature and geography offer less protection against climate change.

A case in point is Florida, where a currently comfortable climate has led to a booming economy and fast-growing population – and where the risks and the costs of climate change will be much worse than the national average. In an analysis parallel to our national study, we found that a partial accounting of the costs of inaction on climate change could amount to as much as 5 percent of Florida's state income (gross state product, or GSP) by the end of this century. As with the national estimates, this figure excludes many important costs of climate change for which we could not develop meaningful monetary estimates; and all the costs will become larger and larger as temperatures continue to rise beyond 2100.

Our Florida analysis used the same climate projections and the same two scenarios as the national study. Although the temperature changes projected for Florida are slightly smaller than for most other states, they are still important: business as usual will make Florida, on average, 5°F warmer than today in 2050 and 10°F warmer in 2100. The winter, when temperatures are lowest, is currently the most popular time to visit Florida; how much of the state's appeal to visitors and residents will survive an increase in year-round temperatures?

Three of our four categories of national cost estimates could be calculated for Florida; each of them was, unsurprisingly, more serious in the Sunshine State than elsewhere in the nation. The impacts of sea-level rise will be felt all along Florida's lengthy coastline. The calculation of residential real estate losses due to sea-level rise, performed exactly as in the national study, yields a larger percentage of the state economy.

And it is not only residential property that is at risk. Data available for Florida made it possible for us to perform a GIS analysis of the effects of 27 inches of sea level rise – a level that will be reached around 2060 under business as usual. If nothing is done to protect the coastline, 27 inches of sea level rise would put 9 percent of the state's land area, including the homes of 1.5 million people, under water. Of the two counties at the southern tip of the state, Monroe County – including the Keys and most of the Everglades – would lose 99.6 percent of its land area, while Miami-Dade County would lose 70 percent of its area.

Statewide, the facilities at risk from 27 inches of sea level rise include

- 2 nuclear reactors;
- 3 prisons;
- 37 nursing homes;
- 68 hospitals;
- 74 airports;
- 82 low-income housing complexes;
- 115 solid waste disposal sites;
- 140 water treatment facilities;
- 171 assisted livings facilities;
- 247 gas stations
- 277 shopping centers;
- 334 public schools;
- 341 hazardous materials sites, including 5 superfund sites;
- 1,025 churches, synagogues, and mosques;
- 1,362 hotels, motels, and inns;
- and 19,684 historic structures.

Florida's long coastline is also exposed to hurricanes; serious hurricane damages are all too familiar throughout the state. Insurance costs have skyrocketed following major hurricanes in the recent past, forcing the state government to provide expensive subsidies to homeowner insurance. The same method we used to estimate national hurricane damages yields much bigger numbers, as a percentage of the economy, for Florida.

Likewise, the demand for electricity in Florida is strongly correlated with temperature on an hourly basis, reflecting the extensive reliance on air conditioning. On the other hand, there are virtually no heating expenditures to reduce as temperatures rise. As a result, the state's energy costs are projected to rise rapidly, along with the average temperature.

Florida is one of the wettest states in the nation, averaging 54 inches of rainfall annually, and is well supplied with rivers, lakes, and underground aquifers. Nonetheless, heavy agricultural water use for irrigation (both for growing fruits and vegetables during the dry winter months, and for the well-entrenched sugar cane industry), along with rapid residential and commercial development, has led to water shortages in many parts of the state. Florida is already investing in expensive desalination plants to increase water supply – and climate change will make the costs of water supply even higher. However, we were unable to develop a numerical estimate, comparable to our national figure, for climate-related water supply costs in Florida.

We did, however, look at a fourth impact of climate change on the Florida economy: the

expected effects on tourism.[8] It is no secret that people from other states and countries like to visit Florida; 10 percent of the state's economy currently depends on tourism, with a seasonal peak in the winter months when the temperatures are lowest. Climate change will mean that winter temperatures will become more like current summer temperatures, while intensified hurricanes and sea-level rise will erode sandy beaches and make the outdoor tourist experience generally less pleasant.

Yet despite the winter peak, Florida has sizeable tourism revenues even in the off seasons, drawn in part by indoor and non-beach-oriented tourist attractions. We projected that by 2100, climate change under the business-as-usual scenario would reduce tourism's role in the Florida economy, throughout the year, to the level of the least attractive season today. That is, by the end of the century, year-round tourism spending in Florida (measured as a percentage of the state economy) would drop to the current level of tourism in the autumn months, or 76 percent as high as the current annual average. Thus we are conservatively projecting only a 24 percent decline in the relative importance of tourism, over a century which includes 45 inches of sea level rise, 10°F hotter temperatures, and more intense hurricanes. It is easy to imagine those business-as-usual climate conditions causing much greater tourism losses.

With our assumptions, the decline in tourism is the largest component of our estimated cost of inaction for Florida. Tourism losses account for about half of the state's cost of inaction; the four areas together reach 5 percent of GSP by 2100, as shown in Table 4.

Table 4: Costs of Inaction for Florida

in billions of 2006 dollars, except percentages

	2025	2050	2075	2100
Tourism	$9	$40	$88	$167
Hurricanes	$6	$25	$54	$104
Electricity	$1	$5	$10	$18
Real Estate	$11	$23	$33	$56
Summary: Costs of Inaction				
in billions of 2006 dollars	**$27**	**$92**	**$184**	**$345**
as percent of Florida GSP	**1.6%**	**2.8%**	**3.9%**	**5.0%**

[8] We did not create a comparable estimate of tourism losses for the U.S. as a whole because the effect of temperature and other climate changes is less clear over such a large and diverse area: for instance, would Florida's tourism losses result in net national losses, or in offsetting gains to other areas as tourism shifted to other states?

Maximum Vulnerability: Climate Costs in the Caribbean

Some parts of the U.S., such as Florida, will face larger climate costs than others. But the worst climate impacts will be experienced in other countries that are uniquely vulnerable to the anticipated changes. Low-lying coastal regions and, above all, small island nations, are most immediately at risk.

In another study of the costs of inaction, we analyzed the expected costs of climate change for 24 island nations and territories in the Caribbean. Data limitations did not allow us to produce an estimate that is strictly consistent with our U.S. and Florida projections.[9] We did, however, estimate three categories of climate damages: increased hurricane damages, infrastructure damages due to sea-level rise, and losses of tourism revenues. The cost of inaction on climate change – the difference between the business-as-usual and rapid stabilization scenarios – amounted to 10 percent of the region's GDP by 2050, and 22 percent by 2100.

While the average impact is large, the costs vary widely from one island to another. The largest, most diversified and least tourism-dependent economies, such as Puerto Rico and Trinidad and Tobago, face lower than average projected damages, as do a few of the smaller islands that lie outside the usual path of hurricanes, or rise well above sea level. On the other hand, greater than average damages are projected for low-lying islands, and those that are frequently struck by hurricanes. Rising sea levels and increased intensity of hurricanes will make some islands unattractive to tourists, if not entirely uninhabitable to the local population. For some islands that are heavily dependent on tourism, the expected losses of visitors and revenues due to climate change will all but destroy the local economy.

Haiti, the poorest nation of the region, is also projected to suffer overwhelming damage to its infrastructure, which it will be unable to afford to replace – a projection that is sadly consistent with that country's experience of recent storm damages. The destruction of some Caribbean economies by climate change will lead to increased migration out of the region, and the United States will be one of the most likely destinations for the new climate refugees. Thus even in the narrowest terms of self-interest (let alone a broader and more reasonable humanitarian perspective), we cannot view the destruction of Caribbean nations by climate change as merely someone else's problem.

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[9] The U.S. and Florida projections discussed above include projections of expected growth in population and incomes, based on standard government sources. For the 24 disparate political jurisdictions in the Caribbean study, no such economic and demographic projections were available. Therefore, following the example of an earlier World Bank study of some of the Caribbean islands, we assumed no change in population or per capita income for the region. In cases where projected damages grow at the same rate as GDP, our estimates for damages as a percentage of GDP will remain valid under a range of growth rates.

Conclusion: We Can't Afford the Costs of Inaction

There are real costs involved in taking immediate and forceful action to reduce carbon emissions and control the risks of climate change. The best-researched estimates, such as those from Nicholas Stern, or from McKinsey & Company, suggest that roughly one percent of world output needs to be spent on climate mitigation, for some years to come. This is not an amount that should be spent lightly, without careful analysis and planning.

Yet the costs of emission reduction will be a bargain, compared to the high and steadily rising costs of *inaction*. The message of my research, as summarized in this testimony, is that for the United States as a whole, even a partial accounting of the costs of inaction is above one percent of GDP by 2025, and grows steadily worse as time passes and temperatures rise. The most vulnerable parts of the country, such as Florida, face proportionally much greater risks, with a partial accounting of the costs of inaction exceeding five percent of that state's income by the end of this century. Just next door, in the Caribbean, some of the world's most vulnerable nations face more extreme damages, in some cases amounting to near-total destruction of islands and their economies, from the projected business-as-usual climate impacts within this century. This should be viewed by Americans, not just as a loss of exotic vacation opportunities, but as a humanitarian crisis in our backyard, and a likely source of increasing numbers of desperate refugees arriving on our shores.

The bottom line is clear: the cost of taking action to reduce emissions is an offer we can't afford to refuse.

Chairman RANGEL. Thank you, Mr. Ackerman. We are pleased to have Daniel Abbasi, who is the Senior Director with MissionPoint Capital Partners, and also is—runs one of the first and largest private equity funds exclusively focused on financing the transition to a low-carbon economy.

We thank you, that you have taken time to share your views with us today.

STATEMENT OF DANIEL R. ABBASI, DIRECTOR, MISSIONPOINT CAPITAL PARTNERS, NORWALK, CONNECTICUT

Mr. ABBASI. Thank you, Chairman Rangel and Members of the Committee. My name is Dan Abbasi, and I am a Senior Director with MissionPoint Capital Partners. As the Chairman just said, we are exclusively focused on financing the transition to a low-carbon economy.

I appreciate the invitation to testify to the Committee today, and would ask that my written testimony be submitted into the record.

Chairman RANGEL. Without objection.

Mr. ABBASI. MissionPoint's portfolio includes solar, wind, smart metering, geothermal, carbon finance, and other low-carbon companies, as well as companies that cut emissions and optimize traditional power plants.

Our main message to the Committee today is this. Our country now has a profound opportunity before it: To lead the most strategic economic transformation of the 21st century, a massive retooling of the global system of energy production, distribution, and use, one that will cut our exposure to fossil fuel price volatility, and achieve long-term energy security, one that will create a more efficient and globally competitive industrial base, one that will generate hundreds of thousands of jobs, just when we need them the most, and finally, and not least, tackle the fundamental economic threat of unabated climate change.

But we are truly at risk of squandering this opportunity. We have the capital and the talent, but it's mobile. There is a fierce global competition underway to attract them. Here, in the U.S., we are still missing that one critical ingredient, and that is a long-term, stable, comprehensive policy framework.

So, we respectfully offer three recommendations to the Committee, and related recommendations.

First, it is time for Congress to remedy a glaring market failure, an externality, and put a price on carbon.

Second, a well designed cap and trade policy is our preferred mechanism, not a carbon tax.

Third, 75 percent or more of the allowances in the cap and trade policy ought to be auctioned, and a quarter or more of the proceeds used to fund a supplementary package of policies that will stimulate faster adoption of low-carbon solutions than a carbon price alone would.

As we have heard today, some contend that a carbon price will harm our economy. We have heard a lot of discussions of the cost of inaction. Mr. Ackerman mentioned the Stern report, but didn't—I didn't hear the number 5 to 20 times, which is the multiple by which Nicholas Stern, in his authoritative study, estimated the cost of inaction would exceed the cost of action. As Mr. Ackerman and

others have pointed out, these are real economic costs to real industries.

So, you know, I just ask, are we really going to risk our future and miss this profound opportunity, based on fictitious accounting?

We have also discussed the risk to international competitiveness. From our vantage point in the market, the real competitiveness threat is that if we don't price carbon we will lose the opportunity to develop this sector here, in the United States, and be an export leader. Instead, we will end up buying these solutions abroad.

Take Germany. Not a real sunny place. To Mayor Bloomberg's point, not known for its low-cost labor. Their stable feed-in tariff policy has produced the largest installed base of solar power generation in the world, five times more than we have in the United States. They are manufacturing much of their solar cells at home. They have 20 percent market share, and 42,000 jobs to show for it, and are now even enticing away the next generation producers, U.S. companies, thin film solar power companies, to set up their facilities there, in Germany.

We have a meager 7 percent share today, and we should incentivize those companies to stay here, at home, and keep those high-tech jobs here, at home.

But I want to underscore that the new clean energy jobs won't only be for the cutting-edge companies and the genius innovators. With the right policy spurring adoption, each clean energy innovation creates a ripple effect, creates—job-intensive supply chains sprout up, new installations companies, parts companies, service companies.

We love—MissionPoint loves—our own tech innovators in our portfolio, companies like Aminex. But some of our fastest-growing companies, like SunEdison, Hannon Armstrong, UpWind, are service innovators. They figure out ways and new business models to make it easier for customers to finance and adopt these low-carbon solutions, and to get the most energy productivity out of them.

So, why do we favor a cap and trade over carbon tax? Three basic reasons: it's the only way to predictably hit our emissions target; it lets us trade around the emission reduction burden to the least cost source; and third, it will do the most, we are convinced, to unleash American entrepreneurship and inventiveness.

Some object that the administrative costs of the cap and trade will be too high. We simply don't agree. The private sector does know how to do this, we can do this. Many companies, including our own APX, are already competing to provide the tools, the registry infrastructure, the offset protocols, and others to support a cap and trade and keep costs low.

As with the carbon tax, if you auction most of the allowances, you will have a lot of revenue available for other purposes, to reduce distortionary taxes, consumer impacts, and fund other supportive policies.

In the written testimony we lay out over a dozen of these, each intended to supplement the carbon price by reinforcing carbon weighting in our national policy framework. I will quickly mention just a couple.

We would encourage you to extend the R&D tax credit, but some of the carbon auction revenue should be used to provide a higher rate for low carbon, or R&D.

Second, create a new tax credit to accelerate smart meter rollout that will motivate and empower consumers to do efficiency upgrades. One of our companies, Trillian Networks, makes and deploys these meters, and aims to unlock our country's vast reserve of untapped efficiency.

Finally, create new tax credits for rail and intermobile infrastructure, so that we can move freight from highways to rail, where they emit, literally, one-seventh per ton mile of the emissions.

So, Congress does need to act to supply this framework now. We can get it done together with you. Otherwise, we are going to lose the momentum that we have built in the market.

Thank you very much.

[The prepared statement of Mr. Abbasi follows:]

Testimony of Daniel R. Abbasi
Director, MissionPoint Capital Partners
House Committee on Ways & Means
September 18, 2008

Chairman Rangel, Congressman McCrery and Members of the Committee:

Good afternoon. My name is Dan Abbasi, and I'm a Senior Director with MissionPoint Capital Partners, an investment firm in Norwalk, Connecticut that runs one of the first and largest private equity funds exclusively focused on financing the transition to a low-carbon economy.

Thank you for the opportunity to speak to the Ways & Means Committee about the design of a climate change bill. It is a privilege to be with you at this crucial juncture in national policy-making.

The Committee has requested our perspective as clean energy investors on how to design a climate change bill to best encourage innovation and deployment of clean energy.

Three Key Points

I will make three main points in my testimony today.

First, our country has a profound opportunity before us – to establish the U.S. as the global leader in fostering a clean, low-carbon economy by building one of the most strategic industries of the 21st Century, one that will:

- Boost job creation just when we need it most;
- Diversify our energy supply and achieve long-term energy security; and
- Tackle the fundamentally economic threat of unabated climate change.

Second, this opportunity is time-perishable and hanging in the balance because mobile, global capital is looking for a home today, and the U.S. still lacks a primary ingredient for success: a comprehensive, wise and stable policy framework that sends the right short and long-term signals to investors and entrepreneurs. Most fundamentally, it is time for Congress to remedy a glaring market failure and institute a price on carbon. The market is primed to respond today: we as capital providers are ready, entrepreneurs are mobilized, companies big and small are poised to create and deploy a wide range of low-carbon solutions. Moreover, scientific indicators unequivocally point to the urgency of action.

Third, we believe that a properly designed cap-and-trade policy is the preferred mechanism to price carbon, not a carbon tax. It is the most dynamic system for stimulating our

nation's entrepreneurial capacity and achieving the policy objective at the least cost. Further, we recommend auctioning most of the allowances in the cap-and-trade system – 75% or more – and using the revenues to selectively reduce distortionary taxes, to fund a climate change tax credit and to finance a robust package of supplementary policies to stimulate the innovation and deployment of low-carbon solutions. Later in the testimony, we describe a set of investor-friendly criteria for designing those supplementary policies and then provide over a dozen examples of specific ones we would urge Congress to consider.

I will elaborate on these three points in the balance of this testimony. But first, given that the Committee seeks our input from an investor perspective, it is worth briefly describing how MissionPoint is situated – and differentiated – in the broader investor landscape.

Overview of MissionPoint

First, MissionPoint is a specialist, not a generalist firm. We are entirely focused on financing the transition to a lower-carbon economy. This includes low and no-carbon energy and energy efficiency as well as carbon/environmental financial services. Our view of the carbon mitigation opportunity includes a continuing role for fossil fuels, but with newly aggressive and innovative management of its carbon by-product. Our team brings deep energy and environmental domain expertise based on senior roles in finance, technology, policy and operations at such organizations as General Electric, ABB, SwissRe, FMC and U.S. EPA. The firm was founded and is chaired by Mark Schwartz, former Chairman of Goldman Sachs (Asia) and CEO of Soros Fund Management.

Second, MissionPoint's primary focus is on "growth stage" businesses, where a technology or service is at the threshold of commercialization or already commercialized and needs capital and other support to rapidly scale up and penetrate its target market. This growth-stage focus stems from our belief that carbon mitigation is an urgent, large-scale imperative and that we need to accelerate diffusion of solutions already in existence However, we also carve out a portion of our fund for earlier stage, venture investments that we believe have transformative potential. This dual investment focus mirrors our view that the public policy framework should similarly accelerate both innovative R&D and faster deployment of existing solutions.

Third, MissionPoint is an active business builder that is involved in a hands-on way beyond providing capital. We are not passive investors or asset-allocators. We provide our portfolio companies with strategic guidance, executive talent, technology support, policy guidance, operational support, etc. As such, we are equal parts investor and entrepreneur.

A sampling of our investments includes:

- SunEdison, the leading solar developer and independent power producer in the U.S.
- UpWind Solutions, which services wind installations to maximize power production

- Hannon Armstrong, an efficiency financing company that specializes in funding efficiency upgrades in federal facilities;
- Greenhouse Gas Services, a carbon offset project developer that we formed with General Electric and AES;
- APX, a transaction and data infrastructure company that facilitates creation and tracking of renewable energy certificates and voluntary carbon credits;
- Advanced Aerofoil Technology, an efficient manufacturer of natural gas turbine components that also sells systems to optimize fossil fuel power plants for lower emissions.
- Trilliant Networks, a "smart meter" company that provides technology and products that enable utility and consumer energy efficiency and demand response;
- Amonix, an advanced, high-concentration photovoltaic system manufacturer
- Energy Source, a developer of geothermal power generation assets.

I. A PROFOUND AND STRATEGIC GROWTH OPPORTUNITY

At MissionPoint, we foresee a staggering, multi-decadal investment, growth and job creation opportunity associated with the emerging transformation our global system of energy production and use. Driven by the low-carbon imperative and the pursuit of energy security, trillions of dollars will be invested in the innovation and deployment of efficient, low-carbon solutions across the generation, transmission, distribution and end-use segments of our energy system.

A concerted national strategy to modernize and decarbonize our energy system will provide a wide-range of co-benefits beyond addressing climate change, including:

- Hundreds of thousands of high-quality, technology-led jobs here in the U.S.
- Greater international economic competitiveness, and export leadership
- Greater energy security and diversification, marked by resilience to volatility and scarcity pricing in traditional fuels;
- Greater national security through less dependence on oil and gas imported from politically unstable areas of the world;
- Added protection of human health and the environment from avoidance of air pollutants emitted along with greenhouse gases

The International Energy Agency (IEA) did a major scenario exercise this year projecting the expenditure that would be required above the business-as-usual baseline to reduce global carbon emissions by half by mid-century relative to 2005 levels. It found that up to $47 trillion would need to be invested over the 2010-2050 period in a wide range of technologies. In their scenario, technologies responsible for reducing emissions would be: energy efficiency (36%); renewable energy (21%); carbon dioxide capture & storage

from fossil power plants and industrial facilities (19%); and nuclear, fossil fuel switching and supply side efficiency in power generation (24%). The IEA also found that the $47 trillion would command a big reward: a $51 trillion savings in fuel expenses.

MissionPoint and others are investing across the full range of these technologies. Solar energy is among the standouts, as it continues to experience 40%+ compound growth rates, and wind power, on a much larger base, achieves 20% compound growth rates.

The Prometheus Institute estimates that global solar manufacturing capacity will grow from just under 2 Gigawatts in 2006 to 40-60 Gigawatts by 2015. This estimate suggests a 50% compounded annual growth rate.

- Assuming a capex/watt of $1.00 for the module in 2015, this estimate implies up to $40 to $60 billion in capital investments into manufacturing capacity alone.

- Assuming a total installed system cost of $3/watt in 2015, a 40-60 GW manufacturing base will produce $120 to $180 billion annually in solar power generation systems, of which the solar panels themselves will constitute about half and the remaining "balance of system" and installation will constitute the other half.

But the U.S. must accelerate if it is to attain a leadership position in solar power manufacturing and other globally competitive low-carbon markets. According to PV News, the U.S. share of global solar production was a mere 9% in 2005, then decreased to 7% in 2006, where it held level at 7% again in 2007. Meanwhile, Europe increased its share from 26% to 28% over that same two year period, while the overall size of the pie grew dramatically from 1700MW of global production capacity to 3700 MW. The rest of the world (other than Japan) grew from 18% to 40% share.

Continued growth in these markets will be driven increasingly by:

- Realization of cost reduction through scale economies, with many key technologies on pace to eventually mature to the point that subsidization becomes unnecessary;

- Emergence of stronger, increasingly mainstream market demand; and

- Improvement in relative economics as traditional fuels are required to absorb a carbon price. More on this below.

Provided the market is not interrupted by policy uncertainty and other factors, success along the way toward the low-carbon future should create positive feedback loops that attract:

- More talented management
- More innovation

- More capital
- More solutions
- Lower costs

Declining cost curves over time are a robust trend for wind, photovoltaics, concentrating solar power, geothermal and other renewable energy technologies. Further cost reductions are attainable to a varying extent across technology sets, and we aim to selectively accelerate those with the most room for further cost and performance gains per dollar invested.

Solar, again, is particularly attractive in this regard. Over the last 25 years, we've seen an extremely reliable trend: each time we double installed capacity of solar energy, the price of solar energy drops approximately 18%. Solar power research has reduced solar power costs by nearly 50% in the past decade alone, and we can forecast sizable further cost reductions to come.

Most photovoltaic (PV) modules today are made from crystalline silicon (c-Si) and cost approximately $3.00 per Watt to produce. Even without a shift to more advanced thin film technologies, the cost of the incumbent c-Si technology is projected to drop to $1.70 per watt by 2011, $1.31 by 2016, and $1.10 by 2021. These cost reductions are expected to come largely from manufacturing economies of scale rather than major technological breakthroughs, reinforcing the importance of sustaining a strong policy stimulus so we can progress down the cost curve.

Aggregate installed system costs – which is what the customer ultimately pays – are largely driven by module costs, but also a function of "balance of system" costs (i.e., electrical equipment and mounting structures as well as labor costs for field installation). According to Deutsche Bank, installed costs for c-Si systems today average approximately $7.29/watt and are expected to decline to $4.38/W in 2011, $3.26/W in 2016 and $2.61/W in 2021 (assuming a commercial-scale 150kW system).

We believe that Levelized Cost of Energy (LCOE) is the most important metric by which one can measure the competitiveness of energy technologies. This figure is calculated based on the installed cost of the system, the energy produced over the life of the asset, its operational & maintenance costs, and its financing costs.

The LCOE of c-Si systems today averages about $0.32/kWh and is expected to decline to $0.19/kWh in 2011, $0.14/kWh in 2016 and $0.11/kWh by 2021. The Energy Information Agency projects that average residential grid electricity prices will rise from $0.104/kwh today to $0.108 in 2009 before declining to $0.104 in 2021 – demonstrating a small and relatively stable dispersion around 10 cents and a coming solar cross-over with average grid prices.

MissionPoint believes that as the cost of producing solar energy continues this steady downward march towards "grid parity" (generally viewed as 10 cents per kilowatt-hour, or "kWh"), the demand for solar energy will grow very quickly to an extraordinary level.

DOE Solar America Initiative estimates that solar energy will achieve price parity at panel costs of $1.25 per watt – and that the industry will get there by 2015.

Of course, many people pay already more than the average grid price. The market size today for electricity at prices greater than 15 cents is already $30 billion, a price that solar systems can meet in areas with appropriate sun once federal (and sometimes state) tax credits and incentives are factored in.

Thin-film solar technologies, the next generation after c-Si, are expected to produce even steeper cost declines as they grow in manufacturing scale and increasingly drive industry-wide pricing. First Solar, today's lowest cost thin-film producer, is manufacturing cadmium telluride thin film PV modules at $1.25/watt and expects to produce over 400 MW in 2008.

Job Intensity of Renewable Power

At a time of job loss and uncertainty, it is worth noting that the job-intensity and quality of renewable energy jobs are exceptionally high:

- The U.S. Department of Energy reports that wind energy produces 27% more jobs per kWh than coal-fired energy, and 66% more jobs than natural-gas fired energy.
- 1MW of solar creates 7-10X more man-hours of employment than 1MW of conventional fueled sources.
- The U.S. Solar Energy Industries Association has set a goal of supplying half of all new U.S. electricity generation from the sun by 2025, which it says would create over 260,000 new jobs by 2030.
- An analysis by the European Photovoltaic Industries Association shows that a projected installation of 205 Gigawatts of solar photovoltaics by 2020 could generate 2 million jobs worldwide.
- According to research by Roger Bezdek for the American Solar Energy Society, the U.S. wind industry created 16,000 direct jobs and 36,800 total jobs in 2006.
- According to a study by the Renewable Energy Policy Project, a national development of 50,000 - 70,000 MW of wind energy could potentially create 215,000-331,000 full time equivalent job/years of employment.

Renewable energy tends to generate highly skilled manufacturing, construction and high-tech jobs – as well as new white collar jobs in high-growth companies. Many of these jobs are likely to be inherently domestic and localized, as well as long-term rather than transient. For example, the U.S. has distinctive expertise and competitive advantage to leverage into the high-tech segment of the renewable industry, such as advanced materials. And the service and installation/asset deployment jobs are not easily subject to overseas

outsourcing. Manufacturing in this sector, like others, will continue to be at risk of moving to low-cost overseas operations, but Congressional and state-level support can mitigate this risk through cost-sharing grants for new manufacturing facilities.

We need a supportive policy framework to keep these jobs at home. Earlier this year a major U.S. solar panel manufacturer reported having diverted jobs and in-demand solar panels to overseas markets as a result of aggressive incentives in Europe, including into countries with much less sun than the U.S.

Beyond Renewables

Beyond solar, wind and other renewables, there are many other less iconic but compelling clean energy opportunities to pursue, including:

- Development of a smart grid to enable more productive interconnection of renewables, enabling of demand-response and energy efficiency solutions
- More energy efficient end-use appliances, devices and services
- Carbon capture & sequestration, to manage the carbon by-product associated with fossil fuel generation
- Expansion of carbon-free nuclear power
- Capture/use of waste heat
- Hybrid fossil/renewable generation
- Plug-in hybrid vehicles

Waste heat is an enormous and still relatively untapped electricity resource in our country. Boilers, gas and steam turbines and even the internal combustion engines in automobiles generate heat that today goes unused. One company that MissionPoint evaluated determined that using a patented turbo-expander cycle to capture 20% of the waste heat in energy intensive sectors (e.g., steel, aluminum, copper, cement, refineries) could produce over 180 Gigawatts of electrical power capacity, more than double the nation's renewable capacity, including hydro, at the time. The Energy Independence and Security Act of 2007 authorized a new Recoverable Waste Energy Inventory Program that requires EPA to create a registry of recoverable waste heat from major industrial and large commercial combustion sources and sites in the U.S. and to collaborate with DOE in providing technical assistance to qualifying sites for energy capture. With further policy support and funding for research and deployment, we expect to see more productive use of waste heat in stationary and mobile applications.

With carbon weighting as the key metric rather than technology-specific promotion, we should also see growing creativity in developing hybrid fossil/renewable configurations that can join the power density and scalability advantages of traditional fossil and nuclear power with the low-carbon advantages of renewables. To take just one of many examples, using solar power to do feedwater heating for a coal-fired plant will increase the efficiency of the coal plant dramatically and produce what is, in effect, an increment of emissions-free power.

Perhaps the most well known hybrid configuration – and the most promising emissions reduction technology in transportation -- is hybrid vehicles and plug-in hybrids. It is under-recognized that even while most electricity is generated from fossil fuel sources, the inherent efficiency advantage of an electric drive train over an internal combustion engine is so great that the all-in carbon reductions from mainstream adoption of this technology would be tremendous, and well worth stimulating via all available policy tools.

II. TIME TO PRICE CARBON

Having previewed the enormous scope and magnitude of the investment and growth opportunity, we now outline key reasons why we believe it is time to price carbon now.

1. **Investors / Entrepreneurs are Primed Today:** Capital providers and business builders are primed and ready to go today. MissionPoint was a pioneer in forming a pool of growth capital dedicated to financing the transition to a low-carbon future, and in the past year alone the number of private equity firms investing in clean technology has more than doubled. Venture capitalists invested over $2.2 billion into more than 200 clean technology deals in 2007, a 340% increase from 2005 (Thomson Financial). Broadening to include all investment activity – including venture capital, private equity, public markets, project financings and M&A -- 2006 saw approximately $31 billion of activity. Much of this capital has come into the market anticipating a price on carbon. If a supportive policy framework is not put in place, there is little doubt that a rapid reversal is possible. Investors and business talent will look elsewhere. We will have squandered the market readiness that now exists, and the opportunity for public sector funds to leverage much larger pools of private capital.

2. **Dangerously Late in Addressing Climate Change – Cost of Inaction:** As fact-driven investors, we observe that by almost all scientific accounts, we are dangerously late in addressing climate change. This threat appears just as perilous as war and recession, and perhaps more so given its irreversibility, planetary scope and the intensity of adverse impacts that lie ahead on the trajectory we're presently on. Many others have surely catalogued these impacts to the Committee, but they can be particularly arresting when singled out. For example, several leading scientists from the respected Met Office Hadley Centre for Climate Prediction and Research in the UK projected that under a mid to high emissions scenario we could go from 3% of the planet being in extreme drought to 30% by the end of the century. These are conditions in which agriculture is impossible. Think about the food security implications alone, and the economic consequences.

   We applaud the House for holding hearings recently on the cost of inaction, which indicate that the cost of unabated climate change will be much higher than the costs of a mitigation policy – by 5 to 20 times, according to Sir Nicholas Stern's report and testimony. Many others have reached similar conclusions. This was not spotlighted adequately in the Senate debate this past summer, in which the costs of policy action were presented rather one-sidedly as unacceptable. We must frame our choice

accurately: it is not between the status quo and the costs of policy action. The real choice is between the grave economic risks of unabated climate change and the costs of policy action. Moreover, the costs of inaction are fundamentally economic: apart from disruptions to household well-being and purchasing behavior, especially in coastal zones, unabated climate change will have direct consequences for growth and jobs in a variety of climate-sensitive sectors. agriculture, fishing, forestry, recreation, even oil and gas, as we've seen with extreme weather disruptions.

Having witnessed the Senate floor process on the climate bill earlier this year, it appears that many of our leaders do not recognize the magnitude of the stakes. Going forward, we see risks of continued stalemate. Other critical issues competing for attention on the national agenda may crowd it out, particularly the economic slowdown. So we urge you to transcend business-as-usual and to exercise collective intelligence of the kind the U.S. Congress has historically summoned in moments of peril to our national well-being and to pass a comprehensive climate change bill.

Some economists have suggested that because climate change is a cumulative problem, our policies should be flexibly designed to allow emission reduction obligations to shift around across a 50-year timeframe. But scientists indicate we may be crossing or approaching unknown trip-wires in the climate system today (what they call "non-linear thresholds"). We hear frequently of the "astonished scientist" returning from the field to describe that climate change impacts are happening faster than originally forecast. NASA Scientist Jim Hansen cited recent evidence of the accelerating breakup of the ice sheets in urging policy-makers to reduce the target maximum atmospheric concentration of carbon dioxide from 450-550 down to 350 ppm, a threshold we've passed. The Intergovernmental Panel on Climate Change said the 450 ppm level would give us only a 50% chance of keeping the global average temperature from rising more than 2 degrees C (or 3.6 degrees F) above pre-industrial levels – a level at which increasingly severe impacts may occur; droughts, floods, heat waves, species extinction, sea level rise, ocean acidification, wildfires, spread of infectious diseases. A 50% probability outcome is not what we investors would consider an adequate "margin of safety" in our investment decisions, and should not be satisfactory for public policy purposes either.

We at MissionPoint regularly monitor the science and hold each other accountable to be guided by the facts, just as we are with non-scientific facts and data. Yes, business favors a degree of predictability, but facts on the ground change as circumstances evolve. So what we really need is an ability to consult objective data and a confidence that such data will be accepted as a shared framework for societal action, especially by policy-makers.

For example, many pending climate bills call for periodic review of emissions reduction targets by such bodies as the National Academy of Sciences. Our concern is that such open-ended reassessments are not sufficiently prescriptive. Therefore, MissionPoint introduced a new concept in our April 2008 testimony to the Select Committee on Global Warming urging Congress to specify a composite index of

scientific indicators in the legislation itself so that when each reassessment date arrives, the emissions targets would be adjusted based on measurable impacts – on whether, and by how much, those impacts have worsened or improved relative to the prior forecast. This could help insulate what should be a scientifically driven decision from recurring political pressures. Indicators in the index could include: atmospheric concentrations of greenhouse gases, average global temperature, rate of melting of the Greenland or West Antarctic Ice Sheets, extent and magnitude of drought globally, spread of climate-sensitive disease, incidence/intensity of extreme weather events, ocean acidification and so on. If we had such an index, we in the business community could track its progress just like we track macro-economic indicators and we would actually have better visibility into likely policy changes ahead than if the decision-making process were purely discretionary, as currently envisioned.

3. **Acting Now Avoids Steeper Challenge Later:** The longer we wait to institute a carbon policy, the steeper the reduction in emissions will need to be on a year over year basis going forward if we are to attain the policy objective of mitigating climate change while managing a smooth economic adjustment to a low-carbon future. Experts have estimated that if U.S. emissions peak in 2010 and begin to decline after that, we could reduce at 4% per year, but if our emissions grow moderately and peak in 2020, we would need to reduce by a much more challenging 8% per year.

4. **Non-Market Regulatory Options Loom:** The window for using efficient, market-based mechanisms to address climate change could narrow and even close, based on regulatory and judicial developments and the increasing magnitude of climate change impacts. The July 2008 D.C. Circuit judicial ruling on the Clean Air Interstate Rule left ambiguous whether EPA's existing authority would permit it to use a cap-and-trade mechanism to regulate greenhouse gases, or whether it would need to use traditional command-and-control technology mandates. If Congress does not act expeditiously in 2009, EPA may well try to use its existing authority, which may limit the use of efficient market-based instruments. Hence Congress should assert itself and take the initiative now. EPA aside, if the scientific community continues to identify worsening climate change impacts, the window for a gradually phased-in cap-and-trade system may close anyway, and we will instead be compelled to use a less flexible, more costly regulatory structure that compels one-size-fits-all technology retrofits at the largest emitters and institutes draconian measures in a variety of sectors.

5. **Prompt Start Will Signal Credibility to Investors:** We investors understand that legislators cannot irrevocably bind their successors with a long-term goal – even if enshrined in law, it can be superseded or reversed by a future Congress. This puts a special premium on Congress not just passing a multi-decadal carbon pricing law, but including a "prompt start" and stringent early-year emissions reduction targets. The market appears to be expecting the first compliance year to be 2012 or 2013, but an "upside surprise" here with a fast 2011 start would spark major business and finance interest and capital inflows. Such commitments will also increase the credibility of the longer term commitments embodied in the policy, and stimulate investment in longer-term solutions.

6. **Domestic Action Must Pave Way to International Agreement:** We need to act now because we need to be well positioned to engage in the international negotiations in 2009 toward a post-Kyoto agreement. If Congress does not make legislative headway in the balance of 2008, our chances to push a bill over the line early in 2009, and thereafter proceed to negotiation on a truly compatible international agreement will be reduced. Moreover, our ability to urge other nations – especially developing countries – to reduce their emissions will be squandered. The U.S. needs to lead the next phase of global carbon diplomacy rather than being passive and even defiant observers. This should start with a strong domestic foundation.

III. CAP-AND-TRADE WITH AUCTIONS OVER A CARBON TAX

Assuming agreement that it is time to price carbon, a threshold question before the Congress remains: what should be the mechanism? A carbon tax, a cap-and-trade system, or even both together?

The carbon tax has long been the popular choice of economists and has benefitted from recent public arguments in its favor, from the Congressional Budget Office, from scientist Jim Hansen, the Environmental Justice Forum on Climate Change and other influential policy thinkers. Given this Committee's jurisdiction and carbon tax legislation introduced by Committee Member John Larson, we would expect the Committee to give full consideration to the carbon tax option.

Some have pointed out that a carbon tax and a cap-and-trade can be made to look a lot like each other if certain design points are included. For example, if a cap-and-trade includes a price ceiling (i.e., "safety valve"), then the system will convert to a tax-like system when that price trigger is breached. Similarly, if the rate of the carbon tax were adjusted yearly based on emissions levels in the prior year, then it could be increased or reduced to support an emissions target over time – making it look more like a cap.

But let us put those line-blurring features aside for a moment. MissionPoint believes that a cap-and-trade is far preferable for the following reasons:

1. **Environmental Integrity:** A cap-and-trade sets a firm emissions reduction target and then allows the price of an emissions allowance to float. By contrast, a carbon tax sets a firm price and allows emissions levels to float – thereby undermining the core environmental goal of controlling emissions levels at pre-specified and scientifically determined levels. MissionPoint believes that we do not know the demand elasticities well enough in our economy to set the tax rate needed to get a targeted level of emissions reductions, so we need the certainty of a cap.

2. **Anti-Tax Sentiment and Likelihood of Setting Tax Too Low:** Given this country's long-standing anti-tax sentiment, and the political risks associated with enacting new taxes, we believe that the chances of enacting a carbon tax may be lower than a cap-

and-trade. And even if a carbon tax does pass, we believe there will be pressure to keep it so low that it will be sub-optimal in stimulating needed investments in low-carbon technologies. As noted earlier, one remedial option would be to institute a flexible tax level that updates yearly in response to emissions data, but this would give up the predictability that is the tax's greatest reputed strength.

3. **Trading Flexibility:** A carbon tax is technically a market-based instrument in that it injects a price signal and lets the market respond. But a cap-and-trade more fully harnesses the market's dynamism and captures efficiency through trading. It allows emissions reduction burdens to be traded to the least-cost sources (i.e., those where the cost per ton of carbon dioxide abated is lowest). This is a trait of enormous value to regulated entities, and in reducing the cost of the system to the economy as a whole. The advantage of trading is that a liquid market enables participants to interact and "find" each other, without leaving it to bilateral contracts – in other words it avoids the risk of "ships passing in the night" and comparatively inexpensive emissions reductions going untapped as a result. Extending this logic, a cap-and-trade system will permit the U.S. to trade internationally (international allowances, offsets or both), thereby maximizing flexibility to devote resources to least-cost reductions globally. This will also create options for international coordination toward a targeted outcome that would be harder to accomplish with a carbon tax.

4. **Price Volatility:** Many have argued that a cap-and-trade exposes market participants to volatile pricing, whereas a carbon tax provides price certainty. Congress can use many design features in the carbon bill to manage the risk of extreme volatility, but I hasten to add that some degree of price fluctuation is a characteristic of any properly functioning market – and should be permitted. The direction, duration and patterns of changing price signals provide valuable information about supply-demand dynamics, and market players are accustomed to interpreting and acting on these. Financial instruments (forwards, futures, options) are routinely used to manage and hedge commodity risks of all kinds, and are already emerging to do the same for carbon allowances and offsets. Futures in Regional Greenhouse Gas Initiative (RGGI) allowances are already trading. One of MissionPoint's portfolio companies – Greenhouse Gas Services (GGS) – can structure contracts on carbon offsets to provide price certainty to regulated entities. We would expect to see market participants like GGS facilitate a transparent and liquid forward price curve offering regulated entities price visibility and management options.

   Given these design options and market capabilities, we strongly oppose inclusion of a government-administered price ceiling (i.e., "safety valve" or "escape valve", depending on your perspective) that fixes the maximum price of an allowance. As with a carbon tax, the safety valve would sacrifice the integrity of the emissions cap. But even more to the point, allowing some degree of price fluctuation attracts capital too. The carbon market will accord real value to the "call option" if carbon prices trade freely, while a fixed carbon tax foregoes this upside value entirely. Flattening the upside associated with carbon-mitigating investments will deter risk capital.

Many other creative options beyond a "safety valve" exist for mitigating the risk of extreme price volatility, through flexibility mechanisms such as trading, longer compliance periods, allowing substantial use of offsets, banking of allowances and granting an oversight body (a "Carbon Fed") the authority to administer to conduct early auctions of future-year allowances or other temporary relief measures. Under a banking system, the price should converge toward the long-term abatement supply curve, discounted back at the cost of carry. This can provide incentives to invest early in higher cost abatement strategies and build in needed lead time for their development and commercialization.

5. **Unleashes Entrepreneurship:** We believe a cap-and-trade will unleash maximum entrepreneurship, as new businesses emerge to aggressively pursue carbon-reduction opportunities available anywhere in the economy. A cap-and-trade creates a currency (allowances and offsets) that independent entrepreneurs can produce and/or own autonomously, so it gives them more latitude than a carbon tax system where the primary initiative must be taken by the emitter or other entities exposed to the tax-based price signal. In a tax system, the entrepreneur must persuade the tax-minimizing entity to undertake an emissions reduction action by buying a particular solution, and in increments equal to that entity's tax minimization objectives. In a cap-and-trade system, the entrepreneur has greater degrees of freedom to undertake independent activities that generate offsets detached from a tax-minimizing entity. This market dynamism also may affect the decisions of emitters who might have regarded a carbon tax as grounds for a tax minimization exercise only, whereas they might frame a cap-and-trade system as affording them new revenue generation opportunities. For example, a business may be more inclined in a cap-and-trade system to invest in a technology or other capability to reduce emissions in its own facility, and then package this into a marketable offering to others. Some economists argue that the incentive structures in both models are identical, but theory is not always reality: MissionPoint lives on the ground in these markets and believes these behavioral, organizational and motivational dimensions must be considered.

6. **Private Sector Supply of Cap-and-Trade Infrastructure:** Carbon tax advocates often point to the additional costs the government will incur to create the infrastructure to administer, monitor and enforce a cap-and-trade system, and that regulated entities will bear in terms of compliance costs. But if government creates the basic rules and oversight, much of this infrastructure will be funded by the private sector as it is in other financial and commodity markets. For example, one of MissionPoint's portfolio companies, APX, is an infrastructure provider for power settlement and environmental commodity markets and is ready to do much more to facilitate efficient nationwide implementation of a mandatory cap-and-trade. APX has tremendous experience on which it can build. It is North America's largest provider of environmental registries, providing transaction and data infrastructure including tracking of renewable energy certificates and early adopter markets for greenhouse gas offsets and allowances. APX is the technology and service provider for the first formal state Energy Efficiency Portfolio Standard program, provides the underlying technology and manages one of the nation's largest Demand Response programs and is the largest provider of hosted

power operations to the wind power industry. APX's sophisticated suite of software allows power developers, utilities, non-regulated generators and financial companies to navigate market entry, schedule and settle power transactions on their respective Independent System Operators (ISO). MissionPoint, APX and many others stand ready to execute on Congress' guidelines in implementing a cap-and-trade system.

We also launched last year a U.S. carbon originator called Greenhouse Gas Services, LLC ("GGS"), in partnership with General Electric and AES. GGS has core competencies in the development and operation of energy projects, in risk analysis and transaction structuring for energy projects, in marketing and in carbon markets. We made this early investment, because we recognized that the U.S. voluntary carbon market is at a critical stage of development marked by inconsistent standards and a paucity of credible suppliers. Yes we wanted to seize a profitable position, but also to demonstrate to policymakers and the market that the private sector can and will step in to produce rigorous carbon offset methodologies and high quality offsets, and thereby pave the way for a mandatory cap-and-trade system. We and the other GGS's partners stand ready to allocate to it hundreds of millions of dollars to develop voluntary, pre-compliance and ultimately compliance offset credits here in the U.S., which will reduce the aggregate cost of compliance to our economy.

Cap and Trade Design Points

Among the many key design points for a cap-and-trade bill, let me just note a few of our recommendations. These outcomes would best allow MissionPoint and others like us to invest in solutions that will in turn help Congress to achieve its policy goals.

- **A Stringent Emissions Target** capable of stabilizing atmospheric concentrations at 450 ppm of CO2 equivalent – by getting down to at least 1990 emissions levels by 2020 and then reducing at least 4% per year to reach 80% below 1990 levels by 2050. We believe a prompt start is needed – no later than 2010.

- **An Upstream Point of Regulation** that would require submission of allowances by all producers and importers of fossil carbon-based fuel (coal, oil, natural gas), rather than downstream fuel users/emitters. Since the problem arises when fossil carbon is removed from the subsurface, it makes sense to regulate it there. This would reduce the risk of leakage to non-covered sectors or to smaller companies under the regulated size threshold, and maximize environmental integrity in attaining the cap. It would achieve administrative simplification by obligating approximately 2,000 fuel producer or importers to surrender allowances for compliance, rather than over 400,000 downstream large emitters.

- **No Safety Valve:** As noted earlier, we strongly oppose inclusion of a "safety valve" that fixes the maximum price of an allowance. This would limit the upside associated with carbon-mitigating investments and deter capital. Use other cost management options instead, as discussed earlier.

- **Broad But Rigorous Offsets Eligibility:** Offsets reduce costs and increase flexibility. We oppose geographic or quantitative limitations on offset credits so as to maximize the opportunity to reduce GHG emissions at the lowest cost, but support – and are already helping to establish – the most stringent criteria for offset quality.

Allocation / Auction Decision

The Committee particularly requested MissionPoint's view on the allocation/auction decision and use of the auction proceeds.

Having just explained our preference for a cap-and-trade over a carbon tax, the auction/allocation choice is the one design point in the cap-and-trade system that we believe should be resolved in a way that makes it similar to a carbon tax. That is, we believe that most of the allowances – 75% or more – should be auctioned rather than allocated, so that revenues will be received by the government, as they would be with a carbon tax, and made available for worthwhile policy purposes we'll discuss below.

Some argue that a key advantage of a carbon tax is that it will bring revenue to the government that it can use to offset distortionary taxes. In fact, a cap-and-trade system can offer the exact same virtue if allowances are auctioned. In addition, a cap-and-trade system is likely to generate substantially more revenue than a carbon tax given that the allowance price will probably go higher than a politically feasible tax.

We share the concern of others that generating an additional revenue stream to the government will bring temptations to divert it to other purposes – including wasteful ones. But we believe this risk can be managed, for example by assigning revenues to a special account (akin to a Trust Fund) dedicated to transitional economic assistance and to furthering the core policy objective of carbon mitigation. This will take this critical financing flow off-budget and free it from fluctuations in the annual appropriations process.

In theory, such public policy objectives could be furthered through allocation as well – either in the form of allowances the recipients could then sell, or by permitting the recipients of the allowances to request the equivalent cash option instead of allowances.
A key question then becomes whether such objectives can be more efficiently attained by having the government receive the revenues and administer policy instruments. MissionPoint believe this to be the case. As our discussion of investor-friendly policy instruments below will show, we believe that the tool-set available to the Federal Government is broad and tune-able, and worth funding with sizable auction receipts.

Before discussing those instruments, we will comment briefly on the issue of the allocation/auction percentages. Precedents in U.S. Acid Rain trading program and in the European Union's ETS have distributed allowances at no cost to directly regulated entities. This has created expectations among many that such "grandfathering" should also be undertaken in the coming U.S. system. In fact, we at MissionPoint initially regarded this

question very pragmatically – believing that this ability to distribute allowances freely to emitters gave the government the needed currency for the side-payments and horse-trading that would be required to bring industry and others along and enable a bill to pass and be enacted

Upon further study, our perspective on this has changed, and we now favor auctioning most of the allowances – 75% or more – for many reasons, including:

- The magnitude of asset value that will be created in a carbon allowance program is so much larger than in the acid rain program that it must be treated differently and with recognition of a wider range of legitimate claims on that value.

- One of the lessons of the ETS problematic first phase was that free allocation led, in effect, to overallocation (due to measurement issues and gaming), and as a result the January 2008 European Union's European Trading Scheme Review has proposed 100% auctioning for the power and refinery sectors starting in 2013 (the first year of its Phase 3) and then full auctioning for all sectors by 2020.

- Our review of the economists' work suggests that only a modest share of the allowances would need to be given away free to large emitters to make them whole. The Congressional Budget Office estimated that only 15% or less of the value of the allowances would be needed to offset the net financial losses that shareholders in companies affected by these policies would otherwise face. Work by Bovenberg and Goulder (2000) estimated that fully compensating the coal, oil and natural gas industries, in particular, for lost revenues and reduced asset valuations would require less than 20% of the auction or tax revenues. This stems from the ability of regulated or other exposed industries to pass the carbon cost thru to their customers and other factors.

- Six of the 10 pioneering states in the Regional Greenhouse Gas Emissions Initiative have studied this intensively and intend to auction 100% of their budgeted allowances, with potentially more yet to also take this approach.

- A looming issue is whether the proposed border adjustment mechanism intended to shield domestic industries from competition from imports from uncapped economies will be compliant with World Trade Organization rules. James Barrett of Redefining Progress, among others, has argued that if permits are freely allocated rather than auctioned, such border adjustments would probably not be WTO-compliant, whereas a carbon tax or a cap-and-trade system with auctioning would at least be able to make the case that the border adjustment is leveling the playing field rather than doubly advantaging entities with a windfall and a tariff-like barrier.

- Many of the headaches in a predominantly allocation-based system go away with auctioning. For example, there is no need to deal with whether or not to take away grandfathered emissions from entities when they retire a facility, or to set aside a

new entrant reserve for emerging competitors. Everyone simply buys allowances at auction.

Once we agree to auction a dominant share of the allowances, the next question becomes what to do with the resulting revenue. First, we would expect that 25% or so of allowances that would not be auctioned from the start would be provided to energy and energy-intensive manufacturing companies (and therefore their shareholders) to cushion their relative exposure to carbon pricing for a transitional period, for example to defray the reduced profits of carbon-intensive generating assets or of stranding them altogether. Then, MissionPoint would encourage Congress to apportion the revenues from the 75% allowance auction across several objectives:

- Promote economic efficiency by selectively reducing distortionary taxes (15-25%);
- Ameliorate equity/regressivity problems due to carbon pricing through a climate change tax credit for low and middle income consumers (50-60%); and
- Promote low-carbon technologies and services through a package of supplementary instruments (25%)

We recognize that some of the revenue can and should be spent on the first two objectives. We would encourage, however, that the carbon mitigation objective be factored into the way this is done. So, for example, economic efficiency argues for using some of the revenue to reduce distortionary taxes on labor (payroll tax) and investment (capital gains). Rather than instituting an across-the-board reduction in the capital gains tax, we would encourage Congress to adopt a preferentially low capital gains rate for investments in carbon-mitigating technologies and services. Similarly, some of the revenues should be used to assist lower and middle income households in adjusting to increased energy costs from carbon pricing, probably through a tax credit. But again, rather than simply providing funding for any purpose the recipient chooses, Congress should structure the tax credit instrument so that at least some of it is available only if used for carbon-mitigating efficiency investments. This will reduce the recipient's exposure to the carbon price over time (thereby making it transitional rather than a permanent entitlement) and, in aggregate, should reduce the cost of carbon compliance to the economy as a whole. We will return to this theme below in the discussion of specific proposed policy instruments.

Finally, and most pertinently for today's hearing, we at MissionPoint believe that a substantial portion (25%) of the auction proceeds ought to be apportioned directly to fund supplementary instruments that accelerate low-carbon technologies and services. We refer to these as "supplementary" rather than "complementary" in order to emphasize that the core policy foundation for mitigating carbon dioxide emissions should be a cap-and-trade system and other instruments targeting the same objective should be supplementary to it.

If the total allowance value ranges from $50-250 billion per year, and we take a mid-point of $150 billion per year, then 25% of the 75% of total allowances that are auctioned would amount to approximately $30 billion per year that would be available to fund the supplementary instruments. We believe that well-crafted supplementary instruments can catalyze and incentivize multiples of that sum in terms of private capital, thereby creating a

robust war-chest to tackle the problem of climate change while improving U.S. productivity, competitiveness and job creation.

Justification for Supplementary Instruments

How can we justify expenditures on supplementary instruments, especially when some might regard them as redundant once a cap-and-trade system is put in place to already favor low-carbon solutions? The threshold question is: will a cap-and-trade system, on its own, generate the optimal level of investment needed to attain the targets specified? Our answer is: probably not and therefore we will need a package of supplementary instruments, for the following reasons.

1. **Market Failures:** We in the private sector tend to under-invest in first-of-a-kind technologies since the rewards are rarely commensurate to the risk. Others can free-ride on the creation of knowledge in the first project. So often it is not rational for a market participant to underwrite this unless the public sector offers a subsidy that effectively shares and buys down the risk.

   Furthermore, many barriers to diffusion of new technology are not sensitive to price signals due to other distortions in the market's imperfect transmission system. At MissionPoint, we undertake intensive research in market to diagnose the barriers to adoption of the low-carbon alternative before investing, and we run into these barriers all the time. They include:

   - Information barriers (solution: standards, codes, information clearinghouses);
   - Agency problems (solution: subsidized financing, disclosure requirements)
   - Chicken-and-egg (or "network") problems in large integrated systems like that required for a carbon capture & storage pipeline network (solution: government investment, subsidization or financing tools)
   - Asymmetric information between project developers and lenders (solution: loan guarantees for first-of-a-kind projects); and
   - Incomplete insurance markets for liability (solution: government insurance guarantees or liability caps).

2. **Early Catalyst To Accelerate Economies of Scale:** Supplementary instruments can reduce the aggregate compliance costs of the cap-and-trade system by activating earlier investments in solutions than a cap-and-trade, alone, would generate. The classic example would be early investment in technologies that offer economies of scale and scope. Solar is referenced most frequently as an example here, and indeed many targeted policies worldwide have accelerated its progress down impressively declining cost curves. A related but distinct case occurs when some technologies are higher cost on a per-ton basis initially and perhaps even for a sustained period, but offer greater

execution leverage by being able to produce high-volume reductions from fewer facilities, with fewer decision-makers. For example, a typical carbon capture & storage project (CCS) offers the potential to reduce 5-6 million tons from one power plant, whereas a single methane landfill project might offer 50,000 to 100,000 tons of carbon dioxide equivalent, or less. CCS will experience economies-of-scale too, but with the important additional virtue of reducing emissions in higher volume steps with reduced friction.

3. **Global Competitiveness Issue Puts Extra Premium on Early Stimulus**: So far the competitiveness discussion in the Congress has focused on the risks of the U.S. unilaterally controlling carbon domestically before key developing country trading partners like China cap their own emissions. But in guarding against that risk, we must not overlook the opposite risk, which is moving too late to build a globally competitive clean energy industry in the U.S. and thereby ceding a valuable export leadership position in a technology set that will be strategic for decades to come. If we rely on a cap-and-trade system, alone, to stimulate acceleration of our native technology and export potential, we may forego the benefits of an even faster stimulus due to supplementary instruments. These are extraordinarily fast developing markets and time is of the essence.

4. **Long-Shot Technologies:** As noted earlier, the science unequivocally indicates that we are very late in addressing climate change. Therefore we need Congress to substantially intensify funding for R&D incentives broadly, including lower probability but high-impact breakthrough technologies that the private sector would not invest in without subsidization. We say this not because we can depend on such hail-mary breakthroughs (we cannot, and should avoid hype and false promises that can drain support from more mainstream solutions) but because we may need them and we should invest now in increasing their chances of success. Remember that all stabilization targets focused on 2050 assume that emissions thereafter plunge toward net zero. That will only happen if we make public and private R&D investments now in zero-carbon technologies that will be ready for deployment as early as 2040. MissionPoint believes climate mitigation may be recognized as a national and international emergency within 10 years – inspiring commitment to a massive upscaling of public RD&D spending in the U.S. and around the world. But we should not wait for that catalytic moment. RD&D is inescapably an extended process and, in our view, leadership means not waiting for the emergency.

In the end, the number and type of supplementary instruments we need will vary depending upon key choices the Congress makes about the design of the cap-and-trade. For example, how stringent will the targets be? Will the cost containment measures amount to off-ramps? What proportion of the compliance burden will be addressable through offsets? If the Congressional process makes choices on these points that drive carbon prices too low, supplementary instruments will be even more important in spurring strategic technological progress in transportation, carbon capture and other areas. If on the other hand, Congress rises to the scientific imperative and passes a stringent bill without

excessive flexibility and off-ramps, then a proportionately more limited set of supplementary policies will be needed.

Furthermore, we must not fall into the trap of becoming so preoccupied with the design of supplementary instruments that we defer the cap-and-trade itself. Today, for example, standalone bills to stimulate carbon capture & storage are in play and there is debate about whether passing them would be a legitimate basis to defer the full cap-and-trade bill itself. One variation of the argument goes like this: we must not institute a cap-and-trade until we have proven technology to meet the targets proposed in the cap-and-trade, or until we have let a particular supplementary instrument run its course so we can assess if it, alone, can succeed in driving adequate emissions reductions.

This approach has characterized government policy for the past eight years and is often described as a "technology-push" model (i.e., policy incentives encourage investment in creation of new technologies and thereby push them into the market). This is contrasted to "technology pull" models, where demand is created to pull low-carbon solutions into the market, for example by relative input re-pricing through a cap-and-trade system. The technology push approach, alone, is like one-handed clapping, as Princeton engineer and carbon specialist Rob Socolow once put it. We need both supply and demand to generate economic activity. And practically speaking, we will not invest into supplying the most significant low-carbon technologies without visibility into a near-term future where they are pulled through by credible policies creating sustainable demand.

General Criteria for Supplementary Instruments

Assuming these justifications for supplementary instruments carry the day, what criteria should Congress use in selecting and designing them? Our view is that the criteria should reflect the needs of capital providers, not because this should amount to an enrichment scheme of course, but because that's the only way capital will be formed and deployed to adequately address climate change.

The sobering realities of the U.S. budget deficit and debt mean that public resources must be used with maximum efficiency and must leverage the larger pools of private investment capital. We have a chronic problem in U.S. policy-making in that those who write the laws frequently lack private sector experience, especially finance experience. We cannot let this knowledge gap lead to ineffective design of supplementary instruments. Our margin for error has been extinguished by our tardiness. New policies must be calibrated to market realities and financial dynamics.

Below are the key criteria we urge the Congress to apply and a discussion of each:

- Rigorously Carbon Weighted
- Long Duration
- Diversity of Instruments Along Technology Life-Cycle
- Performance-Oriented and Dynamically Updating:
- Targeted on Technologies with Most Attainable Performance Gains

- National, Strategic and Synergistic

1. **Rigorously Carbon-Weighted:** Like many, we believe the government should not pick technology winners – at least not at a specific level. Such choices are better left to the private sector. But we should acknowledge that the very notion of supplementary instruments implies more categorical specificity than the economy-wide cap-and-trade, the latter being a system whose very strength lies in its ability to level the playing field and create full cross-sectoral and cross-technology fungibility so that the cheapest emissions reductions will be prioritized and harvested. Supplementary policy instruments, by contrast, often entail picking certain categories like carbon capture & storage or vehicle fuels and targeting incentives to them. Our point is that this level of selection with regard to technology category should be allowed, but that within such categories, the instruments should be neutral as to specific companies and technologies. The selection of a technology category should based on strategic importance for carbon mitigation and then incentives should be structured so that intra-category winners prevail based on carbon weighting.

   Let's take the example of vehicle fuels. EPA is finalizing its contentious rule implementing the 2007 Energy Law requirement that new renewable fuel production facilities meet a standard of 20% better than petroleum-based fuel in terms of lifecycle emissions. EPA has hinted that it is likely to factor in global effects, not just domestic effects. This is a crucial distinction because evidence has mounted that land is being deforested abroad to produce crops that would not otherwise not be demanded were it not for the diversion of so much of the corn crop in the U.S. to ethanol production. This deforestation causes substantial carbon dioxide emissions and, if included in the lifecycle analysis, could make ethanol ineligible under the 20% standard.

   Given this, if we were to apply carbon-weighting to vehicle fuels and not specify a technology, even at the level of saying the fuels must be liquid fuels, then a superior out-of-the-box option like "fuel electricity" could emerge. The use of electricity in electric and plug-in hybrid vehicles has the potential to be a lower emitting means of propulsion for our vehicles, even if the generating source is a coal plant. This is due to the huge efficiency gain entailed in moving from a ~15% efficient internal combustion engine to a ~90% efficient electric drive train. The policy lesson here is that the government should not pick winners, but rather should allow all options to compete fairly in a functional category, broadly defined. Fuel electricity should compete on a level playing field with all liquid fuels, including ethanol, and in fact we would encourage Congress to make it eligible on a Btu-equivalent basis for the Renewable Fuel Standard.

   Carbon weighting implies all the sticky challenges associated with life-cycle analysis, but there is no way around this vital tool. We encourage Congress to build the capacity to conduct such analysis and associated carbon accounting for all

proposed bills, just as it does standard budget scoring. This could be accomplished through an in-house capacity, at the Congressional Budget Office for example, or through reliance on another governmental or non-governmental body. With this capability, Congress could, for example, make carbon accounting a key criterion for scoring provisions in the reauthorization of the U.S. Transportation law slated for next year. And I would add that support for carbon-weighting appears to be bipartisan. President Bush endorsed it prominently in his April 2008 Rose Garden speech on climate change, when he called for climate-related technology grants and programs to be carbon-weighted.

2. **Long Duration:** At a time where budget constraints will almost always favor shorter duration, investors strongly prefer longer duration in policy instruments. Congress must understand that while energy technology is dynamic and changing rapidly, it remains an arena of long-term infrastructure investment. Despite casual comparisons, the current energy boom is not like the dot-com era, and is not conducive to overnight riches. In energy as opposed to IT, there are bigger sums of money at risk, for longer periods of time. Energy investing requires long development timelines, must often wait on conservative utility decision-makers to act, and confronts the inertia of slow turnover in incumbent capital stock.

   Let's consider the investment and production tax credits slated to expire at the end of this year. When renewed, they should be long-dated if they are to mobilize capital. This will permit rational planning periods for large new projects, and also spur industry to investment in the required supply chain. When runways are short, we see lost efficiency and higher costs in the development cycle. When the timeframe is artificially compressed, we see more developers competing for the same resources (drill rigs, steel, cranes, gear manufacturers, construction workers), which drives costs up. Long-dated supplementary instruments will relieve these pinch points in the supply chains, rather than exacerbating them, and we'll see a lower aggregate cost to society to comply with the cap-and-trade system.

   Long-dated does not equate to eternal. Renewable energy subsidies can, over time, achieve cost reduction through scaling, with many key technologies maturing to the point that subsidization becomes unnecessary. As positive feedback loops kick in – drawing more talented management, innovation, capital, solutions and lower costs – incentives can eventually be phased out. However, this must be done carefully. Making such incentives investor-friendly will mean letting all investments that have fairly applied and are in the queue obtain their subsidy even if the first one thru has crossed some sun-setting trigger like cost parity on an unsubsidized basis.

3. **Diversity of Instruments Along Technology Life-Cycle:** We need a diversity of policy instruments addressing each stage of the technology lifecycle: from pre-commercial phases including basic research, applied research, development and demonstration to the crucial final phase: commercialization and deployment. DOE tends to be in the early R&D business (e.g., Small Business Innovation Research grants), whereas MissionPoint seeks more public support for its focus at the

commercialization end of the spectrum. We need to restore a balance between early-stage and deployment-stage incentives to help ensure that the technologies developed in the national laboratories or nurtured in the private sector by federal R&D funding, actually get to the marketplace.

It is critical not just to design the instruments, but to fund them. There are many deployment-oriented programs that Congress authorized in EPACT 2005, but were not funded or were funded insufficiently. These cut across many areas, including public buildings, private building energy codes, appliance efficiency, state energy programs, low income efficiency programs, public information and education and pilot projects. The opportunity to dedicate a recurring revenue stream from carbon auctions to such programs, thereby avoiding the need for uncertain appropriations, would help to overcome this neglected follow-through. States have traditionally done a better job of targeting dollars at commercialization and scale-up activities (e.g., state cost-sharing for manufacturing facilities), and we would encourage the Federal government to emulate their example.

4. **Performance-Oriented and Dynamically Updating:** As implied by the carbon-weighting criterion, we would encourage Congress to make its policy instruments output or performance-oriented, rather than input-oriented wherever possible. Take the example of distributing carbon allowances to states foreseen in the leading Senate carbon bill – or the functionally equivalent option of auctioning the allowances and granting the cash equivalent. Some states have argued that if the federal cap-and-trade system is to preempt multi-state programs like the Regional Greenhouse Gas Initiative, then allowances should be allocated to the states to make them "whole" for revenue they will forego by not being able to conduct their planned state auctions. Such "make-whole" revenue could be granted in support of efficiency programs to preserve the policy objective. But then, what should be the basis of the Federal allocation to the states? Matching state expenditures on efficiency programs? State performance in fulfilling efficiency objectives, such as reduced energy consumption per capita or reduced Vehicle Miles Traveled (VMT)? Our view is that this sort of supplementary policy instrument should be based on the latter, on a measurable performance output. A corollary of being performance-oriented is dynamic updating. So the distributions to states would not be a scheduled entitlement specified in advance, but would be updated at discrete intervals based on measured state performance.

5. **Targeted on Technologies with Most Attainable Performance Gains:** Supplementary instruments should be targeted to technologies that, according to independent expert validation, offer the greatest comparative potential for improvement to come, in terms of performance, cost, etc. Estimating such potentials can be controversial, given the possibility for non-linear research breakthroughs. But they are not entirely mysterious either, and experts working from the first-principles of physics can often forecast the remaining gains to be squeezed out via investment in a specific research pathway. There are recurring

patterns of technology development, where periods of rapidly improving performance improvement then plateau toward an asymptotic limit.

A good example of this is wind vs. solar. Most energy technologists will tell you that while wind technology is cheaper than solar today on a cents per kilowatt hour basis, solar has more room for improvement to come, and is likely to far surpass wind eventually in terms of its costs, flexibility and ubiquity. Where such consensus exists, prudent public policy should preferentially accelerate those technologies. As the cost of producing solar energy continues its steady downward march towards "grid parity" (generally viewed as 10 cents per kilowatt-hour, or "kWh"), the demand for solar energy will grow very quickly to a staggering level. DOE Solar America Initiative estimates that solar energy will achieve price parity at panel costs of $1.25 per watt – and that the industry will get there by 2015.

6. **National, Strategic and Synergistic:** It is not enough to fashion supplementary instruments that are individually effective. We need to compose an integrated package that reflects mutual dependencies and synergies between these instruments, so that the whole will amount to more than a sum of the parts. This means that we need to assert a national level of coordination, if not jurisdiction, in place of a state patchwork of state-by-state decision-making on certain key energy issues.

   - Transportation policy is a good example. We've never had a truly national transportation policy for building up our intermodal infrastructure across state jurisdictions. Instead, we have widespread earmarking and formula-based apportionments of federal highway funds and other resources. This has limited our ability to implement vital strategic changes, such as financing the infrastructure to move freight from the roads to rail, where energy usage is much lower.

   - The power grid is another example. Today we have a balkanized grid with 200,000 miles of power lines divided among 500 owners. Public utility commissions operate at the state level and the rules they use to evaluate transmission upgrades and investments usually discourage major grid projects that cross state lines. In states with low electric rates, utility regulators are focused on keeping those rates low and resist efforts to build new lines that may export their power. We need to spend ~ $60 billion to build a high voltage backbone that will reduce congestion as generation increases and remote wind and solar sources interconnect. Congress and FERC have implemented reforms such as the July 2008 rule on transmission pricing reform, to try to attract more private finance to this urgent national priority. But we would encourage Congress to put more public funding behind this and to follow through, despite influential objections, to building the two designated national transmission corridors resulting from the 2007 Energy Law. Congress needs to understand the complex linkages here. We don't just need <u>more</u> transmission, we need

modernized transmission if, for example, wind is to be cost effective at more than a minimal (e.g., 5%) system penetration. As an intermittent source, wind energy can strain our grid, particularly as we drive penetration rates higher – even toward the 20% target spelled out in a DOE study this year. Issues of harmonic distortion, reactive power compensation, voltage regulation and frequency control, minimization of costly spinning reserves (i.e., backup natural gas generators that kick in when the wind's not blowing) must be addressed through improvement in the grid and associated components.

- We also need policies that better reflect the synergies between energy efficiency and renewable energy. California's solar initiative is pioneering in this regard, requiring that if you want to tap the solar incentive for your household, you must first do an efficiency audit. This makes sense under a carbon-weighting hierarchy: efficiency investments are routinely the cheapest way to avoid carbon emissions on a cost per ton basis. So opportunities for efficiency gains should be at least identified and ideally harnessed before higher cost solar options are subsidized.

- Moreover, the federal government to act in a more coordinated and supportive fashion when it interfaces with the clean energy industry as its business leaders choose where to locate globally. Germany provides an example here. When a clean energy firm seeks to do business in Germany, and the government validates that it fits their development needs, the national as well as state governments tend to do a lot more hand-holding than we do in the U.S. because they've made a strategic commitment to this industry. They map out federal, state and regional incentives to subsidize the building of manufacturing facilities and personnel training costs. They often assist the company with utility costs. They work with the company on quality-of-life issues to support recruitment. We have learned this first-hand as MissionPoint's portfolio company Advanced Aerofoil Technologies builds a gas turbine component manufacturing facility today in Germany. States in the U.S. do provide more hand-holding than the Federal government, and the competitive dynamic between them can drive incentive packages to an attractive level. But it is time for the U.S. to make a national commitment.

Specific Supplementary Policy Instruments

The above are a set of criteria to be guided by, not a strict checklist. Given these, what kinds of specific supplementary policy instruments would we like to see Congress advance? Before offering examples, I would note that the Ways & Means Committee is well positioned to lead on many of these instruments. By modifying existing tax policies, or fashioning entirely new ones, the Committee can fine-tune our tax code to selectively reduce the carbon intensity of our economy, particularly if offsetting revenue can be

generated by auctioning the carbon allowances. Below are our recommendation for specific supplementary instruments, followed by a discussion of each:

1. Extend, and Improve on, Renewable Tax Incentives
2. Introduce Low-Carbon R&D Grants and Tax Credits
3. Accelerate Smart Meters to Enable Efficiency
4. Accelerate Government Usage of Energy Service Performance Contracts
5. Professionalize and Expand Loan Guarantee Program
6. Enhance Accelerated Depreciation Rules
7. Nationalize Time-Dependent Valuation in Building Codes
8. Tradeable Low-Carbon Obligation to Accelerate Carbon Capture & Storage on Coal Plants
9. Preferential Corporate Tax and Capital Gains Taxes for Low-Carbon Solutions
10. Reduce Vehicle Miles Traveled Through Highway-to-Rail Shift and Carbon-Efficient Mortgage Deductions
11. Expand (and Internationalize) Forest Conservation Bonds
12. Climate Change Tax Credit – add Bonus for Efficiency Investments
13. Promote/Fund Carbon-Efficient Utility Rate Designs

1. **Extend -- and Improve on -- Renewable Tax Incentives:** First, and at long last, we urge Congress to extend the Investment Tax Credit and Production Tax Credit before they expire at the end of this year – and to do so with longer (10+ year) durations than spelled out in pending bills. We are part of a vibrant growth industry that is counting on these credits, and primed for acceleration and greater capital inflows if the extension terms are improved enough to constitute an upside surprise. As deployment incentives, these tax credits operate at a crucial phase of the technology lifecycle for carbon mitigation – getting these solutions out into the field where they can start reducing emissions right away. Without getting into the Congressional debate over whether and how pay-go applies to these particular extensions, common sense suggests that the availability of carbon auction revenues should ease the funding issue in the outyears and enable Congress to act more boldly.

   I would note that the math on tax credit extensions is not additive. In other words, 4 extensions of 2-years does not equal one 8-year extension. The uncertainty associated with each extension creates little boom-bust cycles and increases the cost of capital. We need lead time, not only for each project (where development cycles for large installations are 3-6 years) but for the builders of supply chains to have enough visibility into sustained demand to justify investing in domestic manufacturing facilities.

   We encourage Congress not only to lengthen the extensions, but to look for ways to make our nation's renewable promotion program even more stimulative. After first extending existing credits, Congress could consider offering an even more investor-friendly alternative such as a Feed-In-Tariff (FiT), whereby a fixed subsidy is paid to

the generator "feeding" renewable energy into the grid. Those operating under the extended PTC or ITC regimes would have the option to either continue the same terms or to upgrade to the FiT. In this way, the compact with investors to provide stability would not be violated, but neither would a potential improvement be crowded out. The FiT policy has led Denmark, Germany and Spain to the largest renewable penetration percentages in the world. The Swiss introduced a new FiT this summer and to avoid disrupting the industry, they grandfathered in PV installations installed between the inception of their deliberations in 2006 and the 2008 implementation date. The FiT mechanism has largely been ignored in the U.S., although variations of it are being experimented with in California (the tiered Performance Based Incentive for solar power), and have been recently been introduced as proposed legislation in Michigan, Rhode Island, Minnesota, and Illinois. Advantages of a FiT include avoidance of the need for a tax appetite to claim the subsidy, a clear performance orientation (relative to the ITC), timely payments rather than tax cycle delays and long durations (European policies tend to lock in the tariff for 20-25 years, depending on the type/size of renewable installation).

As Congress considers re-introducing the national Renewable Portfolio Standard (RPS) this fall or in 2009, we would encourage that it be given strong consideration, provided it is designed to stimulate a range of technologies and backed by credible enforcement. But we would also encourage Congress to debate a Feed-in-Tariff as a more investor-friendly model. The RPS or any quota system offers less confidence to the investor that demand will be sustained once the quota is fulfilled. The FiT also lends itself to greater fine-tuning since rates can be differentiated between different types and sizes of renewable energy, as well as phased down over time as certain MW or unit cost milestones are reached. In the absence of sub-quotas (i.e., a minimum of the total that must be solar), an RPS will only stimulate the lowest cost renewable source (generally wind, rather than solar, power today), whereas a FiT can easily be calibrated to support multiple generation incentives.

Let me provide a couple of examples from our experience in the field. MissionPoint has two thriving portfolio companies whose growth momentum will be adversely affected by a failure to extend the renewable tax incentives. One, called UpWind Solutions, benefits from and complements the Production Tax Credit by supporting the growth of its primary industry beneficiary – wind energy. Unbeknownst to many of its enthusiasts, wind energy has faced significant performance problems. As we analyzed the bottlenecks to the diffusion of this particular low-carbon technology, we saw that gearboxes were failing prematurely and turbine manufacturers were offering shorter warranties and moving away from post-warranty O&M services. Some of this is explained by the lack of operating history on the installed base of turbines, which increased the risks of mechanical failures and shortfalls in electricity output. This created demand for third-party O&M and optimization providers, so we created UpWind. UpWind provides services to keep wind turbine installations well maintained and optimized for maximum electricity production. Upwind's customers need the PTC extension if they're going to keep growing – and, in turn, hiring Upwind in states like TX, CA, Iowa, and Montana. UpWind highlights how emerging renewable industry

growth will spawn additional supporting service industries, including labor intensive industries such as O&M

Another of our portfolio companies, called SunEdison, is a high-growth business solar developer of rooftop and utility-grade installations. The company leverages Investment Tax Credits and other policies to solve a longstanding problem: how to mitigate the high up-front capital costs and transaction headaches associated with buying solar electricity. SunEdison's business model provides solar power to large national accounts like Wal-Mart and Kohl facilities throughout the country. What SunEdison saw was that there are plenty of other commercial and municipal customers out there interested in buying solar power, but who don't because they don't want to have to shop around for systems, contract their own installation and, essentially, pay for 20 years of electricity costs today. SunEdison steps in to develop the project, manages the process, install the solar system on the customer's roof and sells them the power from it for less than what the customer would be paying for utility power, without their having to deal with the hassles of owning and maintaining the system or financing the cost. SunEdison uses all available incentive programs and structuring creativity to close the gap on solar and scale it up much more rapidly, including not just the ITC, but also Solar Renewable Energy Certificates (from state Renewable Portfolio Standard programs) and accelerated depreciation tax treatment. In about five years, the economies-of-scale SunEdison is already achieving should bring solar to parity with fossil fuel electricity without subsidies in areas with good sun and high electricity prices, e.g., Arizona, California, Hawaii, Nevada, New Mexico, and others.

2. **Introduce Low-Carbon R&D Grants and Tax Credits** – We encourage Congress to use new auction revenues to substantially increase direct and indirect energy R&D and thereby provide a stream that is partly insulated from the annual appropriations processes. By direct, we mean direct Federal spending on energy R&D through contracts and grants which is ~$4.7 billion total in 2008 (according to the methodology used by Harvard's Energy Technology Innovation Policy Group). This is about 42% lower than its peak level in 1978 on a constant dollar basis. By indirect, we mean government tax credits intended to stimulate private sector R&D funding. While controversial and probably subject to underestimation errors, some analysts tracking private sector energy funding say it has fallen even faster than public sector funding, from about 50% share of the total energy R&D in the 1980's - 1990's to 24% in 2005 (Gregory F. Nemeta and Daniel M. Kammen, 2006). Some states, like California, Iowa, Wisconsin, and New York, have partly compensated for this decrease by increasing their R&D spending. But what we really need now is a federally coordinated and massively scaled up R&D strategy, at least at the doubling level recommended by the National Commission on Energy Policy in its 2004 report and probably more. The IEA scenario exercise discussed earlier in this testimony calls for $10 to $100 billion in annual expenditures from 2010 – 2050 to achieve the halving of 2005 emissions by 2050. Assuming the U.S. were to share the global burden for research in proportion to its share of global greenhouse gas emissions (approximately 25%), and that the high end of the IEA range were deemed appropriate, we would be looking for a five-fold increase from just under $5 billion in U.S. energy R&D to $25 billion per year.

But this actually understates the challenge, because the 2008 figure of $4.7 billion in energy R&D includes energy research that has nothing to do with mitigating greenhouse gases. We encourage Congress to bring a new selectivity to its R&D spending by allocating substantially more of the total to low-carbon technologies in its direct investment program, and by offering the private sector higher R&D tax credits for low-carbon investments. R&D tax incentives targeted to this or any other policy objective would be subject to difficult questions when defining eligibility criteria. What counts as low-carbon? How will the key policy-makers and IRS rule-makers decide? These are not easy questions but, as noted earlier, the carbon management imperative requires us to do the heavy lifting to work through this despite the complexity, and if we can furnish the government with a carbon life-cycle analysis capability, as we have advocated, it can be used for this purpose.

At MissionPoint, we favor a disproportionate policy emphasis on tax credits over direct contracts and grants, because they leave specific R&D investment and allocation decisions to the private sector, avoid administrative burdens and slowdowns (witness DOE's notoriously slow-starting loan guarantee program) and can avoid the uncertainty of annual appropriations if the available option to make them permanent is exercised. The IRS Section 41 Research & Experimentation (R&E) tax credit, which lapsed at the end of last year, should be extended. It had provided a 20% tax credit for qualified research expenses above a historical baseline. Its $5B average value has tended to go to the computer, software, chemicals/pharmaceutical and transportation sectors, and not the relatively un-innovative energy sector.

To overcome this relative neglect, we believe a special incentive rate of 33% should be created specifically to spur low-carbon R&D, when the tax credit is extended. We would also make it refundable so that smaller, growth companies with less taxable income are able to use it, and we would consider establishing a higher percentage credit for smaller and mid-market companies, as measured by revenue, so that the tax credit value will be less dominated by large companies. This is not just a matter of equity, but of spurring the dynamism we've seen as investors backing growth-stage entrepreneurs.

We also believe the new authorized, but not funded, agency ARPA-E, holds great promise given that it is modeled on the highly successful DARPA and is to be focused on transformational, high-risk energy research that the private sector might not fund alone. After being authorized last year, it failed to receive a funding appropriation so remains a concept only. MissionPoint believes some of the auction revenue should be allocated to this agency, which was originally authorized at $300 million per year at the outset, scaling up to $1 billion per year over the next half decade. It should be staffed with its own in-house carbon analytical capability and charged with a mandate to distribute the auction-sourced funds on a carbon-weighted basis.

In addition to ARPA-E's anticipated vanguard work, some of the auction revenue should be allocated to major low-carbon breakthrough research paths via traditional

programmatic funding channels, especially – in our view – to nuclear fusion. Congress instituted a 1/3rd cut of the President's fusion research request, to $286.5 million in FY 2008 (though only an 8% cut from FY 2007), resulting in the U.S. scaling back its funding of Princeton's Plasma Physics Laboratory and the 7-country, 30-year, $9 billion plus ITER fusion reactor project based in France. The separate Innovative Confinement Concepts program, which distributes fusion research dollars to dozens of research institutions around the U.S., absorbed a cut in FY 2007 to an anemic $19 million. This past May, twenty American Nobel prize-winning physicists sent a letter to President Bush, asking him to support supplemental funds for ITER and other physics work in 2008, pending a hoped-for increase in FY 2009. MissionPoint believes that a portion of the auction revenues should be considered for deployment on fusion and other basic R&D innovation pathways that could ultimately prove crucial in bringing a low-carbon economy to fruition if deployment of existing solutions and more evolutionary advancements prove inadequate to the massive decarbonization challenge ahead.

3. **Accelerate Smart Meters to Enable Efficiency:** The Energy Policy Act of 2005 required state utility commissions to investigate and decide whether to require their utilities to install time-based meters enabling demand response and other energy management services. The Energy Independence and Security Act of 2007 then called on FERC to conduct a national assessment of demand response and produce an action plan within 18 months of enactment. These are encouraging developments, but we would encourage Congress to move more quickly, and to use all options within Federal authority to incentivize state Public Utility Commissions to fully account for the benefits associated with Advanced Metering Infrastructure (AMI) functionality and to expedite its roll-out. This incentive could include using a portion of the auction revenues to finance a tax credit for utilities promoting smart metering, as proposed just last week by Senators Charles Grassley and Max Baucus. Other alternatives would be direct payments to utilities or a federally funded incentive rate of return to utilities for undertaking these initiatives.

   MissionPoint closed an investment this year in Trilliant, Inc., which provides the advanced communications systems that are essentially the "brains" of the smart meter. These devices enable two-way, time-stamped communications over the distribution portion of the power grid, and enable utilities to administer demand-side solutions providing customers with price signals that more accurately reflect the true economic costs of electricity. Utilities can read customer usage at different times of the day and provide them feedback on their usage patterns and costs through new in-home display devices, which will become even more useful as more utilities institute time-of-use pricing. They can empower customers to program their appliances and devices, including smart thermostats, water heater controls, pool pump controls, switches, and other energy demand limiting devices so as to better manage their energy bills and carbon footprints. They also allows utilities to work with customers to curtail power demand during peak demand times and reduce the need to invest in costly new generation capacity.

The small share of energy costs in the overall cost structure of most businesses and many consumer segments has traditionally made them relatively insensitive to energy-price signals. But with the kind of pricing transparency enabled by Trilliant, we expect to see reductions in average prices of electricity and increased deployment of efficiency. These smart meters and associated devices will therefore be an important supplement to carbon pricing, enabling consumers to see and respond to any new increment in their price. Smart grid technology offers many other co-benefits, such as continuous grid monitoring, so that outages can be detected and remedied more quickly, before they become full-scale blackouts.

We can report that Trilliant's value proposition is getting real traction. It has already delivered more than 750,000 intelligent devices with integrated communications supporting advanced metering, demand response and other Smart Grid applications. Its technology is being rolled out in a 1.3 million meter deployment for Hydro One on Ontario, Canada, one of the largest ongoing advanced metering deployments in North America. But we at MissionPoint are asking ourselves how this roll-out could be accelerated here in the U.S. to counteract the increasing costs of generation.

MissionPoint also believes that the smart meters will facilitate more rapid penetration of plug-in hybrid vehicles, a strategic technology for greenhouse gas mitigation. Earlier this year, Ford Motor executives and utility executives from Southern California Edison accelerated their efforts to prompt state utility regulators to establish a nationally uniform technology protocol on how to bill electricity consumers that use plug-in hybrids. Smart meters' time interval data and other functionality will help solve this. Success will allow plug-in hybrids to communicate with the electricity grid, to potentially store energy on a distributed basis, and should help motivate auto manufacturers to mass produce the vehicles.

4. **Accelerate Government Usage of Energy Service Performance Contracts:** One of our portfolio companies – Hannon Armstrong, LLC – is the market leader in securitizing Energy Savings Performance Contracts (ESPCs) with the Federal government and is increasingly extending into commercial and industrial accounts. The ESPC contractual vehicle was statutorily created in 1978 and amended in EPAct 1992, and has saved the federal government billions of dollars. They offer a way for the government to get the lifecycle savings from efficiency improvements, without appropriating the dollars for the upfront investment.

   Despite this, over the past year, the Department of Defense (DOD) has used very little of the authority it has to tap into third-party financing and execute its widespread energy efficiency opportunities. MissionPoint believes that DOD, and other agencies, should be using this vehicle to at least attain the specified levels of required efficiency spelled out in EPACT 2005 and strengthened in 2007 via Executive Order. It calls for agencies of the federal government to attain year-over-year energy intensity reductions to 3%, culminating in a total energy intensity reduction of 30% by 2015. We would urge Congress to seek to remedy the declining use of this vehicle by DOD, in particular, using any means within the Congress' formal or informal authority.

Moreover, Congress has not yet authorized DOD to use ESPCs for mobile platforms, as encouraged by the Defense Science Board Task Force on DOD Energy Strategy "More Fight – Less Fuel". To take just one example, re-engining the B-52 fleet would yield net savings of $11 billion. The major impediment to this expansion of ESPC authority today is a scoring conflict between the Congressional Budget Office (CBO) and the Office of Management and Budget, wherein CBO consistently and inexplicably fails to account for the energy savings side of the ledger in its cost estimates of enabling legislation.

While the most rational correction of this problem would be for CBO and OMB to re-score this potential expansion as being zero cost to the Treasury, if this is not possible, then Congress should consider using a portion of the auction revenues to offset the scored cost of the mobile ESPCs. In reality, this money would not be required, and Congress would be able to retain those revenues for other purposes. But the methodological hurdle would be overcome.

5. **Professionalize and Expand Loan Guarantee Program:** The loan guarantee program authorized by Congress in EPACT 2005 to back technologies that reduce or sequester greenhouse gas emissions has been very slow out of the gate. The final rule for the program was not issued until October 2007, when it invited 16 pre-applicants to submit applications. DOE is still reviewing those applications later submitted and announced in June three additional solicitations for a total of $30.5 billion for renewable energy, energy efficiency, advanced Transmission & Distribution, and nuclear power (including front-end fuel cycle). Years have passed and DOE is only now beginning to actually issue loan guarantees. Senators Bingaman and Domenici have proposed a new low-carbon corporation to move loan guarantees out of the civil service and into quasi-public management by a more agile entity. We endorse this proposed change and believe that those loan guarantees support for nuclear power should be increased given the high cost of each plant and therefore the limited number of plants that will be backed under the current limits. MissionPoint continues to favor intensification of Federal and State support for nuclear as a large-magnitude, low-carbon generation option.

6. **Enhance Accelerated Depreciation Rules**: We see a straightforward justification for generous accelerated depreciation provisions for renewable energy. Traditional fossil fuel generators can deduct fuel cost in the year consumed from their taxable income. By contrast, renewable energy generators, which typically have the benefit of free fuel (the blowing wind or shining sun), must invest more in capex upfront, but then have no fuel cost to deduct. So renewable energy is systematically disadvantaged by having to deduct the all-in cost of energy over a longer period, increasing its effective cost. Accordingly, Congress has already set out a Modified Accelerated Cost-Recovery System (MACRS), establishing a set of class lives for different assets, including an accelerated 5-year depreciation for solar, wind and geothermal property placed in service after 1986 and seven years for certain biomass assets. Then this year's federal Economic Stimulus Act, enacted in February 2008, included a 50% bonus depreciation

provision for eligible renewable-energy systems acquired and placed in service this year. We encourage Congress to consider extending this bonus depreciation provision beyond 2008, and to liberalize it so that any financier of the assets can claim the deduction (rather than only the original taxpayer using the asset).

We would also urge that MACRS eligibility be expanded to other low-carbon technologies such as smart meters and end-use efficiency devices. As more digital intelligence is applied to energy assets, the R&D, deployment and obsolescence cycle will speed up (e.g., the use of advanced semiconductors in power electronics and power management). It therefore makes sense for these assets to benefit from accelerated depreciation so that utilities can assess them as shorter-lived assets with accompanying tax benefits.

7. **Nationalize Time Dependent Valuation in Building Codes:** California has been a leader in advancing efficiency through stringent building codes. In 2005, the California Energy Commission pioneered a new concept called Time Dependent Valuation (TDV) in its revision to the Title 24 Building Standards. TDV considers the varying cost of delivering electricity hour-by-hour and across 16 diverse climate zones in California. Historically, the standards viewed energy costs as flat over time and did not factor in these intersecting time and geographic variations. Now, for example, TDV software used by building designers awards compliance credits to different appliances and building systems based on whether they draw power during the peak time of day (i.e., a scorching mid-August day), when the cost of delivering electricity is highest, or off-peak (4 a.m. on a fall morning) – and all the hourly cost variations in between. TDV will help reduce the costs of generation and, in some cases, reduce emissions since peak demand is when the least efficient and most polluting plants come online. We encourage Congress to consider providing incentives out of the auction revenue to states as an incentive to incorporate TDV in their building code revisions – so that this can be nationalized as a best practice. In addition to potential emissions reductions, the cost reductions from peak shifting and shaving would help cushion the incremental carbon price – making it an important "supplementary" policy to the cap-and-trade system.

   We would also encourage Congress to also consult with experts on whether additional fine-tuning could create a Carbon-Dependent Valuation (CDV) methodology that would add a carbon overlay to the time and geographic features of TDV. This would reflect the carbon content of a particular zone's generation mix, as well as the varying carbon efficiency of different appliances and building practices.

8. **Tradeable Low-Carbon Obligation to Accelerate Carbon Capture & Storage on Coal Plants:** For all its pervasiveness in our economy, greenhouse gas emissions are a surprisingly concentrated problem. According to a July 2008 report by The Boston Consulting Group (BCG), if the 1,000 largest fossil-fuel-burning power generators and industrial manufacturing facilities implemented Carbon Capture & Sequestration (CCS) by 2030, more than 1/3rd of the projected total global emissions could be reduced. The report noted that high cost and uncertainty have been major roadblocks to

commercializing and deploying the technology. BCG found that a stable carbon market price of €30 per ton could allow CCS to pay for itself, but that an additional subsidy of €100 billion during the ramp-up time would be needed.

Our own research at MissionPoint indicates that the required carbon price for CCS may need to be somewhat higher than the €30. In fact we don't know the true cost profile yet because many of the scale-up challenges have not yet been tackled in a commercial facility, creating a level of uncertainty that is unattractive to investors and commands a prohibitive risk premium. All these factors – immature technology, uncertainty, long-term payback, carbon price volatility – suggest the need for government intervention to risk-share and accelerate this technology.

CCS could be accelerated by providing bonus allowances for injected tons as part of the cap-and-trade regime – as envisioned in pending legislation. However, this would leave CCS implementation optional and its scale-up uncertain. A stricter and probably faster-starting approach to early acceleration of CCS would be to institute a policy conceived by Robert Williams of Princeton University and Dave Hawkins of the Natural Resources Defense Council called a "low-carbon generation obligation" applicable only to coal plants.

In this model, each retail power supplier would be required to provide a growing fraction of coal power generation with CCS (at 85-90% capture) in its electricity supply portfolio each year. The proportion would be set at a level large enough to cover the new coal generating capacity expected to be built during 2012-2020. Williams estimates this to start at 0.3% of coal power generation in 2012 to 2.2% by 2015 to 9.3% by 2020. Each obligated retail power supplier would self-generate low-carbon coal power, or purchase it from independent electricity suppliers, or purchase credits in a tradeable credit market. The credit value in ¢/kWh would equate to the cost increment for coal power with CCS, and selling these credits would make it profitable for some coal power generators to pursue CCS. The incremental CCS cost would increase costs at low-carbon coal power plants, but the purchase obligation required of all retail suppliers would spread these costs over all their ratepayers. Williams proposes that the incremental cost would be $1.3 - $2 billion per year depending on the rate of learning over time, and spread evenly over all U.S. rate-payers, showing a less than 1% increase in electricity prices over the period. This aggregate cost is consistent with Congressman Rick Boucher's legislation to provide $1 billion per year to CCS, though he suggests a different mechanism. We would encourage Congress to consider increasing the percentage beyond that envisioned by Williams, and arranging for the incremental cost to be borne equally between rate-payers and the allowance auction revenue pool.

One might ask why we would advocate a separate trading regime for low-carbon coal power at the same time an economy-wide cap-and-trade would be put in place. The answer is that CCS is a strategic technology and investors have demonstrated significant technical and economic risk aversion to it so far. CCS would be optional in a cap-and-trade, so we believe a targeted incentive that would mandate its phase-in

would accelerate it significantly, and therefore warrants a separate trading regime among the retail suppliers. We would, however, be open to embedding this as a sub-regime of the cap-and-trade system with bonus ratios (as discussed). Then the double-dip problem would need to be managed. Either CCS would be excluded from cap-and-trade eligibility, or both policies would be allowed to pay out, in order to further incentivize investors to embrace this high-risk technology.

Another model would be to use a portion of auction revenues to fund a public reverse auction in which market participants would bid the minimum long-term government offtake price or subsidy needed to deliver a specified magnitude carbon dioxide reductions from a single facility. If the quantities of emissions reductions awarded were substantial enough (say four million tons per year), then the market clearing price would be set by technologies like CCS, rather than "cheaper tons". This kind of subsidy would have the virtue of being sensitive to magnitude of emissions reduced and being guaranteed, rather than fluctuating with allowance or credit values. Therefore it would be more attractive to many investors. We would encourage pegging the subsidy to production in kWh, rather than upfront capital expenditure.

9. **Preferential Corporate Tax and Capital Gains Taxes for Low-Carbon Solutions:** We recognize that there is a movement afoot to urge Congress to reduce the corporate tax rate across the board to increase our country's attractiveness to mobile investment capital, while closing loopholes that have long created a lower effective rate for companies that can afford the best tax counsel. We believe that many of the arguments advanced for this change apply with special force to companies in the emerging clean energy industry. Therefore we would urge Congress to consider fashioning a special, lower corporate tax rate for companies that produce and sell carbon mitigation products or services. Having an internationally competitive tax regime is important for all industries, but especially for major new industries like clean energy that are deciding today where to take root across the world. Talent, innovation and capital are mobile and Congress should entice this industry to the U.S. Of 30 industrialized nations, the U.S. had the second highest corporate tax rate (after Japan) in 2006. If lowering corporate tax rates proves politically impossible, another option would be to provide tax holidays of specified duration to eligible clean energy firms, as some countries do today (e.g., Singapore's 17 year tax holiday for a photovoltaic manufacturing facility).

   For earlier stage companies without taxable income, a more appropriate instrument would be to institute a preferentially lower capital gains rate – or exemption – for investments in low-carbon technologies and services. Or, if Congress decides to increase the overall capital gains rate, as one of the Presidential candidates is calling for, then the rate for low-carbon investments could be maintained at current levels, giving them preferential treatment. We would urge Congress to apply some of the auction revenue to this purpose.

10. **Reduce Vehicle Miles Traveled Through Highway-to-Rail Shift and Carbon-Efficient Mortgage Deductions:** Congress says it is determined to remedy our addiction to oil, but many of its policies so far (e.g., favoring renewable fuels as a

solution) have constituted thinking inside the box. Even improving vehicle efficiency is a partial, though extremely important, solution. Rather, we need Congress to think outside the box by taking steps to reduce Vehicle Miles Traveled (VMT) through bold strategic realignments such as: 1) rapidly transitioning passengers and especially freight from the highways to the railways, a much more carbon-efficient mode of transportation; and 2) using tax incentives to promote higher density development and reduce sprawl.

Our primary modes of transportation today – planes, cars, trucks – are not surprisingly the ones most promoted by public infrastructure spending and subsidies. And they are fueled primarily by oil. Congress provides massive road subsidies and most of the funding for airport construction by issuing tax-free government bonds. We need to bring similar public support and incentives to rail, so that we can spur the build-out of an extensive passenger rail and public transit system and propel it largely by electricity (the best low-carbon "fuel" given the efficiency of electric drive trains). It is worth noting that rail emits 1/7th the greenhouse gases that trucking does per gross-ton mile. As Congress approaches the reauthorization of our nation's surface transportation bill next year, we encourage Congress to systematically reallocate significant portions of highway funding to rail infrastructure – including but not limited to expansion of funds for the Congestion Mitigation and Air Quality (CMAQ) program, a useful but indirect mechanism for intermodal financing. Congress should, in this crucial reauthorization, apply rigorous carbon-weighting of the options before making its policy choices.

Studies by the American Association of Railroads anticipate a rail system that will jump from 1% to 1/3 congested over the next 25 years, unless we undertake a spending program of $140 billion, and they've asked public sources to provide approximately 1/3rd of that total. And this would be to just maintain rail's current market share for freight. If we want to increase rail's share, we'll need yet more spending. Therefore we would encourage not only re-allocation of some of the Highway Trust Fund but also use of some of the new carbon auction revenue to these purposes, including full funding of the proposed 25% Freight Rail Infrastructure Tax Credit, extension of the Short line Rehabilitation Tax Credit, and significant new targeted tax incentives for the financing of intermodal connectors and other infrastructure. We believe this would be money well spent, even if it needs to be diverted from spending to decongest highway systems. If we are going to reduce congestion and thereby encourage usage of a particular mode of transportation, let us focus preferentially on those modes that are most carbon efficient.

In terms of mitigating sprawl, we would urge Congress to modify consumer and developer incentives. Consider author Douglas E. Morris' idea that the home mortgage deduction should be modified so that it is available on a go-forward basis only to those who buy in sprawl-minimizing (and therefore carbon-efficient) locations such as existing urban areas, small town centers or near public transportation stops. While this is probably too much of a radical discontinuity to achieve passage, it is the kind of bold action Congress should be considering to reduce transportation emissions, while improving our national quality of life. Morris aims to soften his blow somewhat by

favoring grandfathering of all existing mortgages, but making the modification apply to future mortgages. But a variation of his proposal that might be more passable would be to simply provide a higher mortgage deduction rate (a bonus multiplier of 1.5, for example) for location-efficient mortgages. As with the original proposal, eligibilities would need to be carefully designed so as not to disadvantage certain socio-economic groups. But this kind of innovation would nonetheless use federal tax abatement authority in a more focused way to fulfill this crucial policy objective. Congressman Earl Blumenauer's visionary smart growth bill (H.R. 6495) includes among its provisions a location-efficient mortgage concept equally worthy of consideration for auction revenue funding.

Congress should also emulate California's path-breaking work in this area. The California Senate just approved over Labor Day Weekend 2008 a bill intended to discourage sprawl as its population that commanded the support of environmentalists and home builders. It would loosely tie billions of dollars in state and federal transportation subsidies to cities' and counties' compliance with sprawl mitigation as they do their planning for roads, bridges and housing. It would seek to promote building near existing job centers and public transit or create higher-density developments close to jobs and transit stops.

11. **Expand (and Internationalize) Forest Conservation Bonds**: The $370 billion Farm Bill passed this year established a new national program authorizing the issuance of $500 million in tax credit bonds (which provide bondholders tax credits in lieu of tax-exempt interest) for the acquisition of forestland for conservation purposes. Some have contended that this program was designed to favor a particular Montana forest to be acquired by the Nature Conservancy and Trust for Public Land, and therefore that its wider availability is limited. But the instrument appears worthy and we believe should be expanded for a broader group of users and specifically to promote conservation of forests for carbon mitigation purposes. If we are going to ask developing countries to preserve their forests, we need to lead by example. Congress might also look at making these bonds apply for U.S. acquisition of rainforests abroad.

12. **Fund Climate Change Tax Credit – add Bonus for Efficiency Investments:** Bob Greenstein, Executive Director of the Center on Budget and Policy Priorities, testified to the Senate Finance Committee in April 2008 that the revenue from auctioning about half the carbon allowances would preserve the purchasing power of the poorest 20% of Americans and significant relief to the bottom 80%. Of the variations he offered, MissionPoint would favor his proposed single, refundable "climate change tax credit" available to low and middle-income households and adjusted based on family size, rather than expansion of the Earned Income Tax Credit which leaves out a significant middle-income segment. We also agree with Mr. Greenstein that the Electronic Benefit Transfer (EBT) system should also be used to administer an equivalent of the tax credit to the poor households that are not currently within the scope of the income tax system.

However, we would also advise Congress to consider modifying Mr. Greenstein's proposal by splitting it into a base credit available on an unconditional basis, and an incremental credit available only for the same recipients to invest in energy efficiency products, whether in the home, the personal vehicle or otherwise. This would have the significant advantage of providing recurring savings to the household beyond the flat credit since energy consumption would be reduced. Recognizing this, the Model Rule for the Regional Greenhouse Gas Initiative specified that each state must allocate at least 25% of its budgeted allowances to a consumer benefit or strategic energy purpose account to be used to promote energy efficiency, to mitigate electricity ratepayer impacts, or to promote lower-carbon-emitting energy technologies. Dallas Burtraw and his colleagues at Resources for the Future did a study for the State of Maryland and found that the dedication of 25% of the allowance value to investments in end-use efficiency could offset any increase in retail electricity price that would occur from the state's joining RGGI.

13. **Carbon-Efficient Utility Rate Designs:** The Federal government has traditionally refrained from encroaching on state prerogatives in utility regulation. However, it has significant latitude to use disbursement of federal funds to promote, if not to require, favorable state policy-making. We would encourage Congress to use a portion of the carbon allowance revenue to provide positive incentives to motivate state regulators to adopt decoupled rate designs that are more favorable to efficiency and carbon mitigation. Variations of this are already encompassed in pending Federal cap-and-trade legislation. We are intrigued by a new decoupling rate design proposed by the National Regulatory Research Institute called a Straight Fixed Variable (SFV) rate, which it then combines with a revenue neutral energy efficiency fee-bate (a combined fee and rebate). This rate would ensure utility recovery of all fixed costs through a fixed rate charge, rather than making part of this recovery dependent on fluctuating electricity usage. As such, it would "decouple" a utility's ability to earn its regulated return from the volume of electricity it sells, and eliminate a key disincentive to invest in efficiency. It reportedly has administrative advantages over other decoupling proposals. But we are especially intrigued by the conjoined fee-bate, which would basically charge fees to those who user more than a benchmark amount of electricity, while rebating an equivalent amount in the same rate class to those who use less than the benchmark. This is a crucial part of the overall package, because without it, users could actually be less incentivized to reduce energy usage under an SFV rate because less of their utility bill would be subject to fluctuating usage. Congress should consider rewarding state regulators who mandate this rate design by providing incentive auction revenue to them to be used in augmenting the efficiency investments beyond that enabled by the revenue-neutral feebate (e.g., the rebate dollars could be matched by auction revenue dollars on some pre-specified ratio, up to a cap).

CONCLUSION

In July of this year, the G-8 leaders pledged in Japan to "move toward a low-carbon society" by cutting greenhouse gas emissions in half by 2050. But it was a pledge, not a

binding commitment, and the group failed to agree on interim targets for the next 10-20 years that would make the pledge actionable. Pledges aside, the U.S. Energy Information Administration outlook released in June showed the world heading in exactly the opposite direction – with carbon dioxide emissions projected to increase by 51% by 2030 if we stay with business-as-usual policies.

Will Congress fashion and enact a bold and integrated policy package capable of stimulating a true transformation of our system of energy production and use – of shifting us from a +50% to a -50% emissions trajectory? Will it recognize and capture the wide range of associated benefits promised by this transformation, in terms of economic growth, job creation, energy security and health?

MissionPoint, and many others prepared to build the clean energy economy now, hope the answer is yes.

To sum up, we believe that:

- The U.S. has an extraordinary opportunity ahead to lead the most strategic industry of the 21st Century
- In order to seize the opportunity, Congress needs to price carbon.
- A cap-and-trade mechanism is our preferred way to price it.
- 25% of the allowances should be distributed as transitional aid to industries in proportion to their retained exposure so as not to provide a windfall;
- 75% or more of the allowances in the cap-and-trade should be auctioned and the proceeds put into a trust fund to be used:
    - To reduce distortionary taxes;
    - To mitigate adverse impacts on consumers through a broad climate change tax credit, part of which would be dedicated to financing end-use efficiency upgrades; and
    - To fund a range of bold, creative and carbon-weighted supplementary policies intended to accelerate research, development, demonstration and deployment of low-carbon technologies. We have provided an illustrative set of such policies for Congress' consideration.

On behalf of my colleagues at MissionPoint, I thank the committee for the opportunity to provide our input to your deliberations. We stand ready to do our part, and look forward to your leadership.

Chairman RANGEL. Thank you for your contribution. Now we will hear from Jerome Ringo, who is a clean air and clean energy advocate, and environmentalist for many years, and has contributed to the United Nations.

You came all the way from California to be with us, didn't you?

Mr. RINGO. Actually, Louisiana.

Chairman RANGEL. Louisiana?

Mr. RINGO. My office is in San Francisco, but I live in Louisiana.

Chairman RANGEL. Well, thank you so much for sharing your views with us, Mr. Ringo.

STATEMENT OF JEROME RINGO, PRESIDENT, APOLLO ALLIANCE, SAN FRANCISCO, CALIFORNIA

Mr. RINGO. Thank you very much, Mr. Chairman and Members of the Committee, for the invitation.

This is a time of daunting challenges and yet boundless opportunity. We, at the Apollo Alliance, recognize the challenges, challenges like foreign oil dependency. It puts our national security and economic future at risk.

We recognize the price of energy, as it skyrockets, as American families struggle, poor people in particular, who have to make a decision between a gallon of gas or a gallon of milk.

We recognize the growing threats of global warming in this economy, and the environmental and human costs, in particular the hurricanes of the Gulf region. As I mentioned, I'm from Louisiana. I just returned back from evacuating from Hurricane Ike, 2 weeks ago evacuating from Hurricane Gustav, evacuating from Hurricane Katrina, evacuating from Hurricane Rita, all the result of intensive storms because of the warm waters of the Gulf of Mexico, which is like adding steroids to those storms: a result of global warming.

If we don't do anything, we don't create any opportunities just as described, and we remain stuck in the status quo.

The opportunities that are recognized by the Apollo Alliance is that we have developed a new Apollo program, and it's a comprehensive, 10-year, $500 billion investment strategy to move America to climate stability, energy security, and economic prosperity.

The new Apollo program invests in energy efficiency, conservation, clean fuels, rapid transit, next generation vehicles, and advance manufacturing, smart growth, and millions of made-in-America jobs, 5 million jobs, to be exact.

We believe that Congress should support a major public investment in clean energy economy. One way to do that is a cap and invest, a policy that auctions off permits like legislation sponsored by Representative Markey and Representative Doggett.

An emissions permit auction is estimated to raise between $50 billion and $300 billion per year to invest in a new clean energy economy. This money should be used to aid new technologies and enter the mass market and develop green-collar jobs, a strong demand. It should be used to insure that these technologies are manufactured domestically. This money should be invested in the domestic workforce, so that we have the skills needed in manufacturing, design, installation, maintenance, and science.

It should be invested in such projects such as a 21st century power grid, a world class transit system, fixing America's transportation infrastructure, rebuilding and retooling America's manufacturers in research and development, all of which will create jobs.

The investment should be made with an eye toward aiding workers and industry in a transition, and helping communities that have been disproportionately affected by the old energy economy, to lift them out of poverty. For example, the provisions of the workforce assistance at 4 percent in Congressman Doggett's Climate Matters Act is a good start.

A cap and trade investment with an auction of permits can be a win-win-win, and it can help curb global warming. It can provide energy security, and stimulate the economy while leveling the playing field for those that have been victims of that disproportionate impact.

As cap and invest policy is sweet, it can be bitter, too. If emission trading permits are given to companies instead of auctioning them off, then we make rich companies richer. Exxon Mobile made $40.6 billion in 2007, which is three times the profit of Microsoft, four times the profit of Wal-Mart, while people in America still lost their jobs.

We are more likely to build a new energy future with good jobs for working Americans if we ensure any new energy policy is an investment strategy, as well as a regulatory strategy. Thank you very much.

[The prepared statement of Mr. Ringo follows:]

Prepared Statement of Jerome Ringo, President, Apollo Alliance, San Francisco, California

Chairman Rangel and Members of the Committee, thank you for inviting me here today to talk about an issue of crucial importance to our Nation's future.

For Americans this is a time of daunting challenges and boundless opportunities. We have become more and more dependent on foreign oil, putting our national security and economic future at risk. We have seen the price of energy skyrocket as American families struggle to make ends meet—choosing between a gallon of gas and a gallon of milk. And we have seen the growing threat of climate instability and all its economic, environmental and human costs.

The food lines and emerging FEMA failures of Hurricane Ike remind us of the threat that became a reality as Hurricane Katrina pounded our shores. She provided a stark reminder that America faces not only a climate crisis, but a crisis of economic inequality as well.

But fortunately our energy, climate and economic crises also present tremendous opportunity. The Apollo Alliance offers a unique perspective on the issue before this Committee, "cap and trade," or as we like to call it "cap and invest." As a coalition of labor unions, businesses, environmentalists, and community advocates, we believe our Nation can and must achieve a triple bottom line: Energy security, climate stability and broadly shared economic prosperity. My goal today is to illustrate how a strong "cap and invest" program can help us achieve these goals.

The Apollo Alliance's new policy agenda, *The New Apollo Program*, recognizes that great challenges bring with them great opportunity. We say no to business as usual and yes to a new path that will build a clean energy economy that creates millions of jobs—high-quality jobs that actually pay decent wages and support families. We say yes to a climate stability agenda that also strengthens national security. The economic potential, we believe, will be directly proportionate at a factor of almost 5 to the level of public investment. The Apollo Alliance estimates that an ambitious $500 billion in Federal spending over 10 years would create over 5 million jobs. This includes a broad range of activities such as building efficiency, renewable energy investments, smart growth, advanced grid technology, research and development initiatives and a "cap and invest" program.

Before I illustrate how a "cap and invest" program can be a stimulus toward a new clean energy economy, I'd like to first explain what we mean by the green-collar economy, how we got here and where we go from here.

What are green-collar jobs? Green-collar jobs are well-paid, career track jobs that contribute directly to preserving or enhancing environmental quality. They run the gamut from low-skill, entry-level positions to high-skill, higher-paid jobs, and include opportunities for advancement in both skills and wages.

Green-collar jobs tend to be local. Building retrofits, solar panel repairs, transit line construction—these jobs can't be outsourced. Most of these jobs are in industries that already exist, but that are just now getting involved in the green economy because of policy changes and public commitments to energy efficiency, renewable energy, and transportation.

Green-collar jobs are here and growing and exist in many of the States of this Committee's Members.

The Renewable Energy Trust reports that the clean energy sector in Congressman Neal's State of Massachusetts provides over 14,000 jobs and will soon be the 10th largest sector in the State. And a new report by the Political Economy Research Institute at the University of Massachusetts, Amherst says that investment in energy efficiency retrofits, a smart electrical transmission grid, rapid transit and renewable energy will yield 42,530 jobs.

Most of us know, as do the Congressmen Doggett, Johnson and Brady, that wind energy is going to be bigger in Texas than anywhere else, but did you also know that the University of Texas predicts an additional 123,000 new high-wage jobs by 2020 if Texas moves aggressively toward solar power?

Environment California predicts that by meeting California's Renewable Portfolio Standard goal of 20% by 2010—119,000 person-years of employment will be created at an average salary of $40,000. And there are two measures on November's ballot that would raise the Portfolio Standard.

The clean energy economy is present in Pennsylvania, Michigan, Tennessee, Oregon, Florida and nearly every State in the union. As mentioned above, a $50 billion a year investment over 10 years will lead to the creation of 5 million jobs—jobs like the one held by Eric Chamberlain, a fifth generation native of Rock Port, Missouri. Rock Port was the first town in the Nation to meet all of its energy needs from wind. Chamberlain manages the wind farm operations for the town-owned utility. When he started working part-time at Loess Hills Wind Farm in 2006, he was one of four employees, now there are 30. That might not seem like a big number, but in Rock Port—a town of 1,300, it's significant.

The potential of the clean energy economy is evident. What's not evident is whether we have the human capital or the political will to make it happen. In 2005, a National Association of Manufacturers study found that 90 percent of survey respondents expect a moderate to severe shortage of qualified, skilled employees like machinists and technicians. And the National Renewable Energy Lab concurs that a shortage of skilled labor is a large obstacle to an economy with strong renewable energy and energy efficiency industries. Even more important are the policies that create the demand for these products that in turn create the demand for workers. If we don't pass the Production Tax Credit and Investment Tax Credit, over 116,000 U.S. workers will lose their jobs within a year, and we'll lose nearly $19 billion in investment, according to a February 2008 study by Navigant Consulting for the American Wind Energy Association and the Solar Energy Industries Association.

Congress can foster the growth of the clean energy sector by focusing on specific measures needed to create green-collar jobs. Only by ensuring that all Americans come out winners will we build enough public support to do what must be done on the scale necessary to boost the economy, stabilize the climate and achieve energy independence.

We need a major public investment in the clean energy economy. One way to gather the funds we need for that investment is for the U.S. to enact a "cap and invest" policy that auctions off permits, in the same way they are auctioned in legislation sponsored by Representatives Markey (D–MA) and Doggett (D–TX). At Apollo, we think a "cap and invest" policy should accomplish two major goals.

First, it has to set clear limits on carbon emissions, so that we can dramatically lower our national carbon footprint. This will send a powerful market stimulus and begin to shift our entire energy economy toward low-carbon technologies. Second, it needs to raise significant levels of public funding to reinvest in the new energy future, while ensuring these funds are not siphoned off for wasteful pork barrel projects.

A cap on carbon emissions would establish certainty in the rate of emission reductions necessary for climate stabilization. Emissions reductions would be achieved by reducing the number of carbon permits sold or allocated to the market each year.

Trading these permits would allow the market to achieve carbon reductions at the lowest cost. Emissions permits should be auctioned off to energy-intensive industries and power producers to generate substantial public funding—estimated by the Congressional Budget Office to be between $50 billion to $300 billion per year—to invest in the new clean energy economy. The money would be managed by a new Clean Energy Investment Corporation.

Administering such a fund should achieve three objectives. First, it should continuously bring new technologies to the mass market. Green-collar jobs will develop amidst strong demand. Second, it should ensure that these technologies are manufactured domestically. Third, it should invest in the domestic workforce so that we have the skills needed in manufacturing, design, installation, maintenance and science. The money should be invested in such projects such as a 21st century power grid, a world-class transit system, fixing America's transportation infrastructure, rebuilding and re-tooling American manufacturers and research and development. The investments should be made with an eye towards aiding workers and industries in transition and helping communities that have been disproportionately affected by the old energy economy to lift them out of poverty. Congressman Doggett's Climate MATTERS Act includes such provisions and I support its goals. For example, I support the provision for workers assistance at 4%. I think that is a good start, but I would like to see more money allocated to workers and low-income communities.

If done as just described, a "cap and invest" with an auction of permits can be a win, win, win—it can help stabilize the climate, provide energy security and stimulate the economy while leveling the playing field for those that have been disproportionately left out of the process.

As a "cap and invest" policy is sweet, it can be bitter, too. If emissions trading permits are given to companies instead of auctioning them off, then we make rich companies richer. Exxon Mobil made $40.6 billion in 2007, which was three times the profit of Microsoft and four times the profit of Wal-Mart. In the meantime people lost jobs. This is the wrong way and a lost opportunity, not only to foster the market for clean energy and revolutionize our economy (and lose the potential described above,) but also to assist workers and families caught in the transition and to lift those that have been disproportionately affected by a petroleum-based energy economy.

Also, the European Union implemented a "cap and trade" program that gave away permits. Not only have emissions not been reduced, but the E.U. didn't raise funds to reinvest in R&D, infrastructure or its people.

Other solutions that have been proposed are based upon a carbon tax. While we applaud the efforts of Representative Stark (D–CA) and Larson (D–CT) for taking action, we prefer a cap on emissions. A cap sends a strong signal to the market that there is a limit on emissions that will stay the same even as demand grows. The limit on emissions will be a factor in the business decisions of those deciding whether to invest in a new power plant or a new wind farm. It might make them think twice if they have to pay more and more for carbon each year that goes by. Taxes don't do that and they can be passed on to consumers.

If I leave you with one message today, it is this: We're more likely to build a new energy future with good, green-collar jobs for working Americans if we ensure any new energy policy is an investment strategy as well as a regulatory strategy.

We have called on the "can do" spirit of the original Apollo program in our Alliance's name because we believe the American people are once again ready for a great challenge. Energy will be the transformative issue of our generation.

The challenge for congressional leaders today will be to ensure that we all get there together: working men and women alongside industry, environmentalists, and our national security community.

We're confident this great Nation can get the job done; we're confident we can get there with your leadership.

Thank you.

Chairman RANGEL. Thank you. Peter Barnes, author, a former journalist, and a former expert in this area, we welcome your presence.

STATEMENT OF PETER BARNES, SENIOR FELLOW, TOMALES BAY INSTITUTE, POINT REYES STATION, CALIFORNIA

Mr. BARNES. Thank you very much, Mr. Chairman, Members of the Committee.

I want to recommend to you today a form of carbon capping called cap and dividend. It was briefly mentioned this morning, and I want to speak a little bit more about it now.

If you're going to do a carbon cap, as opposed to a tax, I think cap and dividend is the simplest, fairest, and most effective way to design that cap and trade system. It lets us reduce carbon emissions to the levels that scientists are calling for, without reducing the purchasing power of American families or expanding the size of government.

Cap and dividend has three steps: First, cap the carbon supply, economy-wide; second, auction 100 percent of the permits; and third, return 100 percent of the auction proceeds to the American people in the form of taxable monthly dividends. Let me briefly explain a bit more about these steps.

The cap, ideally, is an upstream cap, that is, a cap on carbon suppliers, rather than carbon emitters. The reason for that is that it's much simpler to administer, and you catch all the carbon in the economy. You can administer the cap by requiring the first sellers of oil, coal, and natural gas—which are the same companies that you would apply a carbon tax to, if you were doing a carbon tax—to buy permits equal to the carbon content of your fuels.

Once a year, these companies would true up and pay a penalty if they don't own enough permits, and that's it. No other businesses would need permits, no smoke stacks would need to be monitored, no bureaucracy would be needed to check up on everybody. So, that's the cap.

Second, of course, as everybody, I think, has said here, you would auction the permits, not give them away.

Third, the bigger question here is what to do with the auction revenue. This proposal says wire that money directly into people's bank accounts—or debit card accounts, if they don't have bank accounts—every month, just like Social Security. A precedent for this is the Alaska Permanent Fund, which takes the revenue from State oil leases in Alaska and pays equal dividends to every resident up there. So, this is kind of like a revenue neutral carbon tax. It's just structured a little differently.

Now, I know there are Members of this Committee who would like to spend the auction revenue on a variety of good things. So, let me say why I think it's better to give the money back to the people.

The number one reason for giving the money back is that the money actually comes from people's pockets in a regressive way. Even though it's the fossil fuel companies that are buying these permits, they pass the costs on to consumers. As the CBO has shown, these higher costs will hit low-income and middle-class families quite hard. So, giving the money back protects these families, and protects consumer buying power, which is 70 percent of our economy. As we're in a recession, it's pretty important to protect that.

The number two reason for giving the money back, I would say, is political. As I don't need to remind you, rising energy prices are an explosive political issue. A carbon cap will raise energy prices further, not just once, but for decades. So, the potential for political backlash is enormous.

Unless you build pocketbook protection into the design of a carbon cap from the get-go, A, it probably won't pass Congress in the first place, but more importantly, it certainly won't survive long enough to do the job that we need it to do.

There are a few other advantages that I would mention. One is that cap and dividend is simple enough that you can explain it to your constituents.

The last point I would make is that—which was mentioned earlier today—is the virtue of simplicity. The Lieberman-Warner bill, which recently died in the Senate, tried to do too many things in one package. It was both a carbon cap and a massive spending bill, as you know, that allocated trillions of dollars over 40 years.

A better approach, I think, is to focus on getting a good carbon cap, a cap that is simple, effective, and popular, something that could get bipartisan support, and conceivably even pass next year, with a new President.

Once you have a cap like that, I think lots of other things will follow. More things do need to be done. But the point I am making is separate the cap from a lot of the other things that need to be done, and make the cap politically appealing and durable. Thank you.

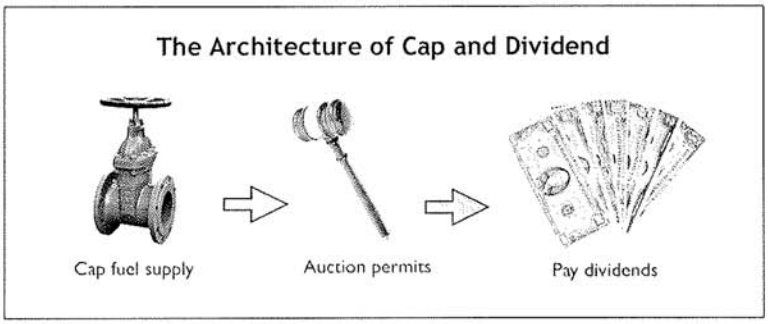
[The prepared statement of Mr. Barnes follows:]

TESTIMONY OF PETER BARNES
TO THE HOUSE WAYS AND MEANS COMMITTEE
September 18, 2008

I come before this committee as an entrepreneur, author and father who cares deeply about this country and the future we are leaving to our children. Among other things, I ran a solar energy company in the 1970s when, briefly, tax credits made solar energy competitive with other forms of energy. I also co-founded a socially responsible investment company and a telephone company, and have written two books about climate change, *Who Owns The Sky?* (Island Press, 2001) and *Climate Solutions: A Citizen's Guide* (Chelsea Green, 2008).

I am here to discuss *cap and dividend*, a climate policy that is simple, fair, effective and market-based. Cap and dividend allows us to reduce carbon dioxide emissions to the levels scientists are calling for, while protecting the incomes and purchasing power of American families.[1]

Cap and dividend has three steps: (1) cap the carbon supply economy-wide; (2) auction 100% of the permits; and (3) return 100% of the proceeds to the American people in the form of equal monthly dividends.



This policy is based on two major premises. The first is that the root cause of climate change is a market failure – the fact that the costs of dumping carbon into the atmosphere are not paid by those who do the dumping, but are shifted to future generations. This market failure can be fixed by a carbon tax or a carbon cap. For political reasons I think a cap is more viable than a tax, but a cap is tricky because it can easily be done wrong.

The second major premise is that the air we share is a gift of creation to all. This means that the economic value that arises from fixing the market failure – what economists call the 'rent' we must charge for dumping greenhouse gases into the air – also belongs to everyone. That rent should not be given away to polluters or other special interests. Rather, it should be used for the benefit of everyone.

[1] More information about cap and dividend is available at www.capanddividend.org.

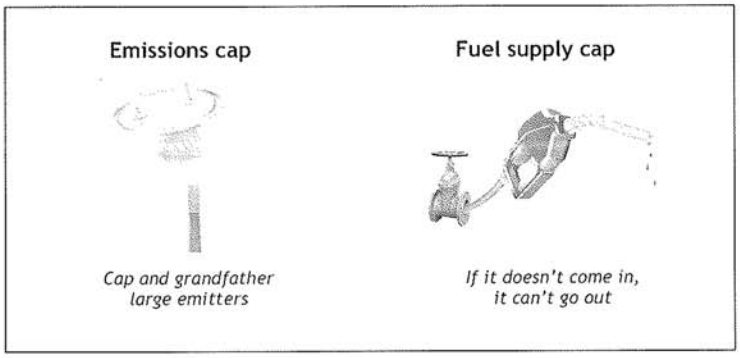
Let me explain the key features of cap and dividend in more detail.

(1) The cap

The cap is an 'upstream' cap – that is, a cap on carbon *suppliers* rather than carbon *emitters*. In this sense it is different from the cap on sulfur, and the reason is that carbon is a different pollutant from sulfur. It doesn't flow from a few large smokestacks; it flows from hundreds of millions of pipes large and small. Trying to cap carbon emitters is therefore extremely difficult. To the extent it can be done, it will be an administrative nightmare for businesses, consumers and government, and it will never catch all the carbon flowing into the air.

By contrast, capping carbon as it enters the economy is relatively simple. The cap can be administered by requiring the first sellers of oil, coal and natural gas to buy permits equal to the carbon content of their fuels. Once a year the companies would 'true up' and pay a stiff penalty if they don't own enough permits. No other businesses would need permits, no smokestacks would need to be monitored, and no large government bureaucracy would be required.

The cap would apply only to a few hundred large companies like Exxon-Mobil, Peabody Coal and El Paso Natural Gas. These are the same companies that would pay a carbon tax under legislation introduced by Representatives Pete Stark, John Larson and others. The difference is that, under a supply cap, these companies would purchase permits instead of paying a tax.



A cap works by issuing permits and then gradually reducing the quantity of permits. In other words, it's like a valve we crank down year after year until we reach a safe level of emissions. The key point of an upstream cap is, *if carbon doesn't come into the economy, it can't go out.*[2]

[2] A separate question is whether offsets and/or safety valves should be allowed to weaken a cap. I believe they should not.

(2) The auction

A crucial question with any cap is, should permits be issued for free or sold at auction? In the case of sulfur, permits were given to historic emitters for free, but we shouldn't do the same thing with carbon. The reason is that, while the economic value of sulfur permits was small, the economic value of carbon permits is immense. As the European experience has shown, issuing free carbon permits leads to higher prices for energy users and windfall profits for the companies that get free permits.

By auctioning permits, the economic value of the atmosphere can be captured by the public and used for the common good. This is what several northeastern states are now doing, and what Senator Barack Obama, the Democratic Presidential nominee, has called for doing at the national level.

In practice, the Treasury Department could conduct periodic competitive auctions of carbon permits, much as it does with Treasury bills.

(3) The dividends

When fuel companies buy permits, they'll pass that cost along to their customers. This is as it should be: the cost of emitting carbon *needs* to be paid by energy users. By adding this currently ignored cost, we'll shift private investment away from fossil fuels and toward efficiency and clean energy.

Higher fuel prices have a big downside, however: they take lots of money out of everyone's pockets. The trillion dollar question is, where does that money go?

If carbon permits are given free to emitters, the higher prices everyone pays will go to private companies. However, if carbon permits are auctioned, the auction revenue can either be spent by the government or returned to the people.

I believe that the best thing to do with the carbon auction revenue is to *give 100% of it back to the American people in equal monthly dividends*. This can be done efficiently through a system of monthly electronic transfers, similar to Social Security. Payments would be wired directly to people's bank or debit card accounts. These payments could be distributed by the Financial Management Service, a branch of the Treasury Department which manages disbursements for Social Security, veterans' and other benefit programs.

Like Social Security benefits, these dividends would be taxed as ordinary income. In this way, the federal government would recoup about 25 percent of the auction revenue, and could use this revenue as it sees fit. This revenue recovery would be done progressively through the income tax system, and the expenditures would be made through the normal appropriation process.

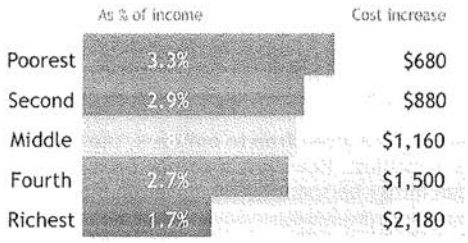
The rationale for cap and dividend

There are several reasons for returning auction revenue through per capita dividends. First, the money raised in permit auctions isn't manna from heaven. It quickly becomes a cost of goods sold and is passed on to the end users of fossil fuels. In other words, it has the same effect as a tax on fossil fuels. And as the cap declines, the effective tax rate goes up.

As the Congressional Budget Office has shown, this effective tax on fossil fuels will have a regressive impact on American households. Prices will rise not only for gas and electricity, but for all products that use fossil fuels in their production or distribution. This will place a disproportionate burden on low-income families, and the middle class will also be hard hit.

According to the CBO, the average U.S. household will pay $1,160 a year in higher prices when emissions are cut 15%, and that amount will rise as emission cuts go deeper.[3] So the number one reason for returning auction revenue to the people is to offset the impact of higher fuel prices.

What a 15% cut in emissions would cost different income groups



Source: Congressional Budget Office

Returning 100% of auction revenue in per capita dividends would cushion the impact of higher carbon prices on everyone. But for many families, it would do more — it would result in net income gains. The gainers would be those families that consume (directly or indirectly) less than the average amount of fossil fuels. For them, dividends would exceed what they pay in higher prices. Low-income families in particular would benefit from cap and dividend, as has been shown by the CBO[4] and other studies.[5]

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[3] Testimony of Peter Orszag to Senate Finance Committee, April 24, 2008. http://www.cbo.gov/ftpdocs/91xx/doc9134/04-24-Cap_Trade_Testimony.pdf

[4] Ibid.

Without going into details of these studies, the broad finding is that the bottom 40% of households would come out ahead, the middle 20% would roughly break even, while the top 40% — the households who burn the most carbon and can afford to pay for it — would show a loss.

These figures, of course, represent aggregates. The key point for individual families is: *any family that reduces its carbon burning can come out ahead.* This is what gives cap and dividend its political appeal. It creates a system in which fighting climate change isn't just about pain; it's also about potential gain. This builds a broad constituency for carbon capping that can sustain a decades-long transition. It makes every family a partner in a nationwide effort. And it does this without increasing the size of government.

Why not return auction revenue through tax cuts or tax credits?

In theory, revenue raised through carbon permit auctions could be returned to the people through a variety of tax reductions, rebates or credits. If this were done, the *amount* of money returned could be the same, but the delivery mechanisms would be different. So why are dividends preferable?

The first set of reasons is economic. Many families are struggling to pay mortgages, gas and utility bills. These families pay their bills every month, and can't wait until April 15 to receive a tax credit. They need real money every month.

Further, it's widely recognized that our economy is in recession; the last thing our economy needs is a decline in consumer purchasing power. In fact, many experts say the opposite: we need to boost consumer purchasing power with a stimulus. A system of monthly cash dividends, paid from carbon auction revenue, would sustain consumer purchasing power not only in the short term, but for the duration of the transition to clean energy.

The second set of reasons is political. Rising energy prices are an explosive issue. A carbon cap will raise fuel prices further, not just once, but for decades — indeed, that is its purpose. The potential for backlash and backsliding is enormous. If the cap is to succeed in reducing emissions to a safe level, it's crucial that the American people understand that the money they pay in higher prices comes back to them reliably and automatically.

There's no better way to remind people that they're getting money back than to send it to them monthly in cash. The trouble with tax credits — besides the fact that they only arrive annually — is that they're far less noticeable than cash.

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[5] James K. Boyce and Matthew Riddle, *Cap and Dividend: How to Curb Global Warming While Protecting the Incomes of American Families*, University of Massachusetts/Amherst, Nov. 2007, http://www.peri.umass.edu/fileadmin/pdf/working_papers/working_papers_101-150/WP150.pdf; J. Andrew Hoerner and Nia Robinson, *A Climate of Change: African-Americans, Global Warming and a Just Climate Policy for the U.S.*, Environmental Justice and Climate Change Initiative, July 2008, http://www.ejcc.org/climateofchange.pdf.

The bottom line on Form 1040 may be lower than it might otherwise have been, but the *reason* it is lower can easily get lost. And paying less on April 15, but still paying, doesn't produce the same positive effect as receiving a monthly payment.

Moreover, the tax code is uneven in its impacts and often opaque in its workings. By contrast, equal monthly dividends define a system that is self-evidently fair and easily understood.

As to why dividends should be universal, rather than limited to people earning below a certain level, the political logic is the same as for Social Security, Medicare and public education. The dividend isn't a welfare check paid by winners to losers. It's a birthright of all Americans, based (in this case) on the fact that we are all owners of the air. A useful precedent is the Alaska Permanent Fund, which for 25 years has paid equal dividends from state oil leases to every Alaska resident. History has shown that universal programs such as these are more popular and durable than programs that target the poor. They unite Americans rather than divide us by economic class.[6]

Why shouldn't the government spend some or all of the auction revenue?

In theory, the common good could be advanced by having the government spend some or all of the auction revenue. There is, arguably, no lack of good uses to which this revenue stream – hundreds of billions of dollars annually – could be put. The difficulties lie in actually deciding what to do with it, and in assuring that everyone (not just powerful interests) shares the benefits.

One possibility is to flow the money into the general treasury and let it be allocated through the normal appropriations process. But the temptation seems to be to pre-allocate the auction revenue by assigning it to a number of trust funds that stretch out for as long as 40 years.

Consider, for example, this year's Lieberman-Warner bill, which one Senator described as "the mother and father of all earmarks." For each year between 2012 and 2050, the Lieberman-Warner bill specified the number of permits that would be given free to various entities, and the percentages of auction revenue that would be similarly allotted. (See chart on following page.)

The trouble is not that the specified uses of this money were bad; some were indeed quite worthy. Rather, the trouble is that pre-allocating so much money for so many years isn't the normal way Congress manages the public purse. It ties the hands of future Congresses and Presidents for decades to come. And in the end, the tab for all this pre-allocated spending is paid by households in higher energy prices.

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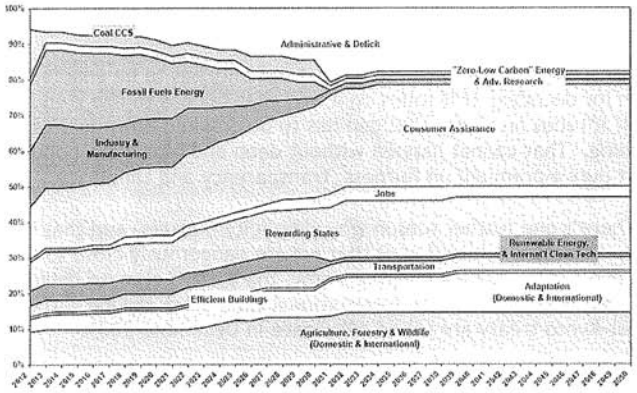
[6] It should also be remembered that, if dividends are taxed, upper-income Americans will pay 35% of them back to the government, while the lowest-income households will keep 100%.

Allocation of Permits and Auction Revenue in Lieberman-Warner[7]



The virtue of simplicity

The ultimate reason for giving all the auction revenue back to the people equally may be this: it has the virtue of simplicity.

The climate crisis itself is incredibly complex, and there is no single, simple fix for it. Many things need to be done by many people and institutions at many levels. But not all the things we need to do are of equal importance, and not all of them need to be done at once. It may make sense to prioritize — to do first things first, and secondary things later.

I would argue that the single most important thing we need to do — and the thing we need to do first — is install a descending economy-wide carbon cap. Once that is done, much else will follow. Markets will respond almost instantly. Billions of dollars of private capital will flow into clean technologies, creating millions of jobs. And public entities (including state and local governments) will also respond. They'll adopt green policies for transportation, scientific research, agriculture, job training, foreign aid and more — not all at once, but in the course of updating existing programs. These new policies will be funded from general revenue, from subsidies that now go to fossil fuels, and potentially from higher levies on oil companies.

Many members of this committee have supported a carbon tax in part because of its simplicity. Cap and dividend is not quite as simple as a carbon tax, but it is close. It is simple to administer — which is important for any program's

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[7] Friends of the Earth, www.foe.org/pdf/LW%20Allocation%20and%20Auction%20Distribution%20Charts.pdf

effectiveness — and it is simple to understand — which is important for any program's popular support. And let us be clear that popular support is *essential* for any climate policy to succeed.

For a climate policy to succeed, it not only has to be *enacted*, it also has to *function* for decades. If it relies on a tax, that tax has to rise steadily for 30 to 40 years. If it relies on a cap, that cap has to be cranked down just as steadily for just as long. That cannot happen without deep and bipartisan popular support. And that puts a premium on fairness, transparency and simplicity.

There's one further reason why simplicity matters, and that has to do with urgency. Scientists are telling us that we are dangerously close to a tipping point — if we don't start curbing emissions now, the earth's climate could spiral out of control. Moreover, there's an international time clock ticking — the negotiations for a post-Kyoto treaty are set to culminate in December 2009.

For both geophysical and geopolitical reasons, I believe the U.S. needs to pass an economy-wide carbon cap in 2009. And the more complicated such a cap is, the harder it will be to do that.

I may be naïve, but I think it's possible that a revenue-neutral (and technology-neutral) carbon cap — i.e., cap and dividend — could pass in the first 100 days of an Obama or McCain administration if it is sought by the new President. If this happens, it would send a much-needed signal to markets, and show the rest of the world that the U.S. is serious about tackling climate change. The new President could then credibly engage in the international negotiations that hopefully will produce a global framework later in 2009.

Such a revenue-neutral carbon cap would not preclude additional climate and energy policies. Indeed, it would pave the way for them by putting a durable cap in place.

So let me optimistically conclude by citing three common-sense precepts:

- Put first things first;
- Keep it simple;
- Don't take money from people unless we absolutely have to.

If we keep these notions in mind, 2009 could be a good year for our climate.

Peter Barnes is currently a fellow at the Tomales Bay Institute in Point Reyes Station, CA.
He can be reached at peter@tomales.org.

Chairman RANGEL. Very interesting view. Now, the President of the American Public Transportation Association, Bill Millar, will express his views on transportation being such a large part of the problem. Share with us your suggestions toward a solution.

STATEMENT OF WILLIAM W. MILLAR, PRESIDENT, AMERICAN PUBLIC TRANSPORTATION ASSOCIATION

Mr. MILLAR. Thank you, Mr. Chairman, Mr. McCrery, Members of the Committee. I do appreciate the opportunity to appear before you on behalf of the 1,500 members of the American Public Transportation Association.

As Congress considers legislation to reduce greenhouse gas emissions, a climate bill must work to reduce transportation-related emissions. The transportation sector produces approximately one-third of all the CO_2 emissions in the U.S., and the transportation sector is the fastest-growing source of greenhouse gas emissions.

Now, there is three widely held options for how to do this. The first is to make our cars and trucks more fuel efficient. The second is to use alternative energy sources that release less CO_2. The third is to provide more travel options that allow Americans to leave their cars behind. All three are important, but I will focus on the third one, providing Americans travel options and, more specifically, the importance of public transportation in reducing greenhouse gas emissions.

Now, you may have seen the figures recently from the Federal Highway Administration, that highway travel has declined in recent months. But with 100 million more Americans expected over the next 40 years, it's believed that the future growth in vehicle miles of travel will erase the emissions savings that the recent increase in café standards and new low-carbon fuels will provide.

We cannot wait on future vehicle improvements and unproven clean fuel sources alone to address transportation emissions. The sooner we address the problem of climate change, our chances for success are so much better.

Now, public transportation investment, land use policies, and tax incentives that promote energy efficient compact development and better transportation choices such as public transportation, encouragement of walking and bicycling, are proven ways to reduce emissions.

For example, the more than 10 billion trips that Americans took on public transportation last year already reduced CO_2 emissions by more than 37 million metric tons in the United States. They did this directly, and through reducing highway congestion and supporting more energy efficient land use.

I want to compliment several Members of this Committee for their early efforts to promote these kinds of solutions, particularly Representative Doggett and Representative Blumenauer, and other cosponsors of the Climate Matters Act are to be commended for their proposal, which would use auction revenue from a cap and trade system to increase public transportation investment, so that we could reduce transportation-related emissions.

Now, let me put the emissions savings from public transit into some perspective. Consider a typical household, two adults work outside the home. In America, it's more likely that each of them

will drive their own car their own way. Commuting each day, let's say a total round trip of about 20 miles a day. If just one of those two people changes his or her habit to using public transportation, the annual CO_2 emissions from that household will fall by about 2 metric tons, equal to about 10 percent.

So, the simple act of one of them starting to commute by transit—take the bus, take the train—will reduce it by about 10 percent. Now, this is greater savings than if that same household were to: install compact fluorescent lights, certainly a good thing to do; weatherize their home, another good thing to do; replace that old refrigerator with an Energy Star appliance. If they do all three of those things, they haven't yet equaled the energy savings from simply one person commuting by public transit.

Now, let's suppose that person finds out public transit works pretty good for them, and they decide maybe they can sell that second car and don't need that so much, take public transit, walk more, ride a bike when they can. At this point, the household saves 30 percent of their household carbon footprint.

Thirty percent of their household carbon footprint is more than if the house could do without electricity—and I don't know very many Americans that would be willing to do without electricity. My point is, public transportation can make a big, big difference in this effort.

Now, besides the greenhouse savings, you get enormous fuel savings from these same actions. Transit riders are already saving over 4.2 billion gallons of gasoline each year. This is three times the amount of petroleum we import from a country like Kuwait, for example.

Investing in public transportation strengthens our economy. The Federal Government tells us for every billion dollars invested in transportation infrastructure, about 35,000 jobs are created. Since the Congress has long ago established the policy of "Buy America," when we purchase buses or rail cars with Federal aid, this is investment that goes in American jobs. The assemblies are done in America with components produced largely in America.

In recent years, transit systems have begun buying large numbers of hybrid-powered buses, natural gas-powered buses. The sales from these buses have put thousands of American workers into new green-collar jobs, jobs that cannot be sent overseas.

Better public transit service is one of the quickest ways that Americans can avoid that high cost of fuel. So, I would encourage more investment in this area.

I thank the Committee for the work you did to save the highway trust fund recently. Chairman Rangel sponsored that bill, and we thank you, sir. That bought us a little bit of time to consider the bigger issues of how we finance transportation beyond the usual sources. We are certainly going to need to look to cap and trade.

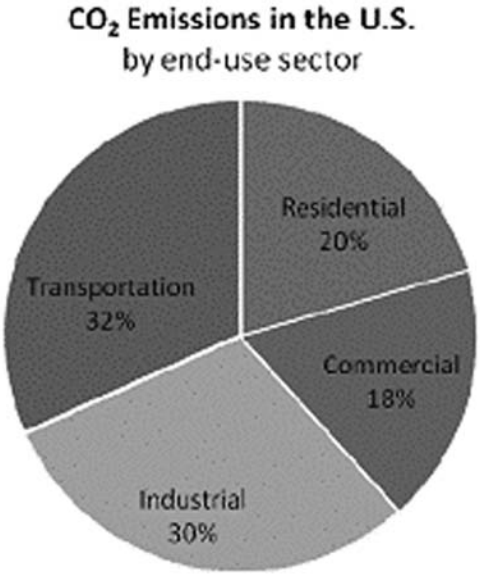
I know my time has expired, there is much more I could say, and I will look forward to answering your questions. Thank you very much, Mr. Chairman.

[The prepared statement of Mr. Millar follows:]

Prepared Statement of William W. Millar,
President, American Public Transportation Association

Chairman Rangel, Ranking Member McCrery and distinguished Members of the Committee, on behalf of the American Public Transportation Association (APTA) I thank you for the opportunity to testify today. As the Congress considers strategies to reduce the emission of greenhouse gases, it must address the challenge of reducing transportation-related emissions.

Our Nation's transportation sector produces one-third of all carbon dioxide (CO_2) emissions in the U.S., and unfortunately transportation is the fastest-growing source of domestic greenhouse gas emissions.



Source: Energy Information Administration (EIA), Emissions of Greenhouse Gases in the United States, http://www.eia.doe.gov/oiaf/1605/ggrpt/flowchart.html.

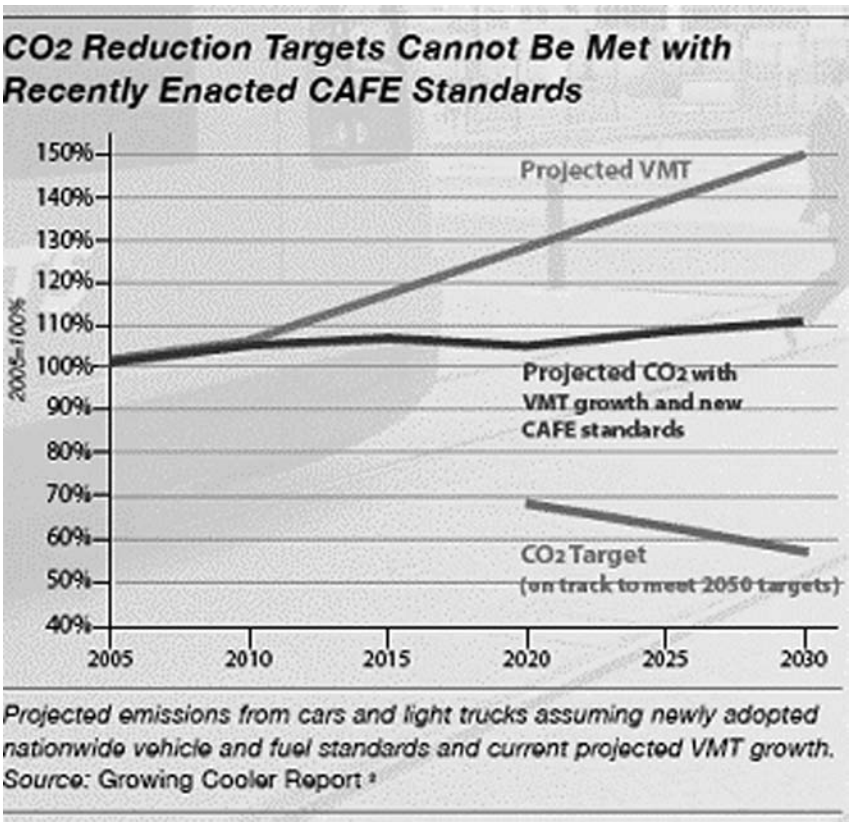
Approximately 85 percent of transportation sector emissions are related to the surface transportation system. To reduce these emissions there are three widely accepted options: First, we can make our cars and trucks more fuel efficient; second, we can use alternative sources of energy that release fewer greenhouse gases when consumed or produced; and third, we can provide more travel options that allow Americans to leave their cars behind. While we need to undertake all of these options, for the purpose of this hearing I will focus principally on the importance of the last option.

To prevent potentially catastrophic increases in average global temperatures, the scientific community has determined that the emissions of all greenhouse gases must be reduced by as much as 85 percent below 2000 levels by 2050.[1] Achieving emissions reductions on this scale in the transportation sector will not be easy. Current research indicates that future growth in private motorized vehicle travel in the next 30 years could negate the emission savings from the recent changes in Corporate Average Fuel Economy (CAFE) standards and the low-carbon fuel requirements contained in the Energy Independence and Security Act of 2007 (P.L. 110–140).[2] Stated simply, this means that for the United States to achieve reductions in transportation emissions on the scale required to limit the potentially disastrous effects of global warming, we must offer Americans more travel choices. We cannot rely alone on future vehicle improvements and unproven clean fuel sources to ad-

[1] Intergovernmental Panel on Climate Change (United Nations and World Meteorological Organization), "Summary for Policymakers, Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC," February 2007.

[2] Urban Land Institute, "Growing Cooler: The Evidence on Urban Development and Climate Change," Don Chen, Reid Ewing and Steve Winkelman, January 2008.

dress transportation emissions. The sooner we begin to address the problem of climate change, our chances for success are better. Americans need more travel choices that allow them to preserve the mobility they have come to expect and reduce their individual carbon footprint. Public transportation can help reduce greenhouse gas emissions. It can do it now, and it can do it by expanding mobility choices.



VMT = Vehicle Miles Traveled;
Source: Urban Land Institute, "Growing Cooler: The Evidence on Urban Development and Climate Change."

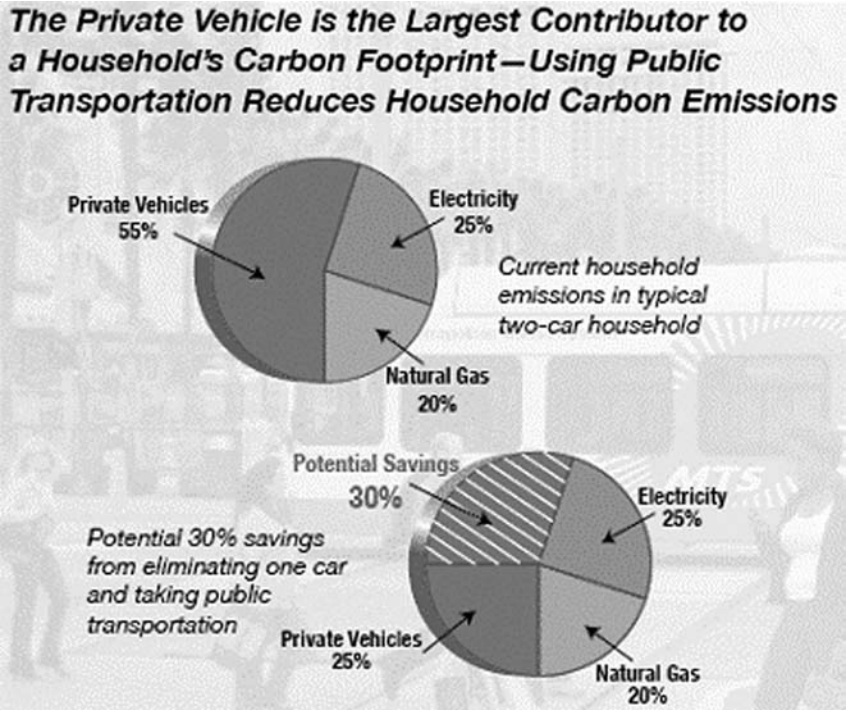
The Role of Public Transportation, Energy Efficient Land Use, and Improved Transportation Choices in Reducing Emissions

Public transportation investment, energy efficient land-use policies and other strategies that promote transportation choices are proven ways to reduce emissions from the transportation sector. Public transportation use currently reduces CO_2 emission by more than **37 million metric tonnes** every year in the United States by reducing travel and congestion on roadways and supporting more efficient land use patterns.[3] Those who choose to ride public transportation reduce their carbon footprint and conserve energy by eliminating travel that would have otherwise been made in a private vehicle, and even the length of vehicle trips is considerably shorter for households that live near transit. In fact, households within close proximity of public transportation drive an average of 4,400 fewer miles annually than those with no access to public transportation. Unfortunately, only 54 percent of American households have access to any public transportation services according to U.S. Census data, and Americans can't use what they don't have.

[3] ICF International, "The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reductions," February 2008.

How do we unleash the power of public transportation to reduce greenhouse gas emissions? To begin, the Federal Government must do its part to expand transit availability and promote energy efficient land-use patterns and transit-oriented development. Efficient land use, combined with good transit service, particularly fixed guideway service—subway, light rail, commuter rail, streetcar and bus rapid transit—produces results far beyond the immediate benefit of increased use of public transportation. Efficient land use has the potential to significantly change the way we live and travel, reducing our individual carbon footprints while preserving and enhancing our mobility. Higher densities allow for closer proximity of housing, employment and retail, reducing driving distances and enabling communities to plan for and support alternative travel options. In many central business districts, trips taken for shopping, dining or other noncommuting purposes are often made on foot—even by those who drive to work.

Allow me to put the emissions savings from transit into perspective. Consider a typical two-adult, two-car household where both adults commute separately by car. If just one person in the household switches a 20-mile total round trip commute to existing public transportation, his or her annual CO_2 emissions will fall by 4,800 pounds per year, equal to a 10 percent reduction in all greenhouse gases produced by members of the household. If the entire household chooses to eliminate one of its cars and take public transportation, walk or ride a bicycle instead of driving for most of its trips, a savings of up to 30 percent of carbon dioxide emissions can be realized. This is more CO_2 savings than if that household went without electricity.



Source: Science Applications International Corporation (SAIC), "Public Transportation's Contribution to U.S. Greenhouse Gas Reduction," September 2007.

The Many Benefits of Public Transportation Investment

While my testimony today has focused on the emissions reductions benefits associated with public transportation use, it is important to point out that public transportation provides enormous benefits beyond it contribution to improving the environment. In particular, public transportation investment by the Federal Government offers unique benefits that cannot be measured solely in terms of emissions reductions. Among its many benefits:

- **Public transportation helps Americans escape the high cost of gasoline, and it promotes energy independence.**

Providing Americans more access to public transportation not only reduces greenhouse gas emissions, it also frees individuals and families from the heavy burden of high gasoline prices. On average, a transit user saves more than $9,500 per year by taking public transportation instead of driving based on today's gas prices. These savings are important not only for individuals and families, they are important when we consider the urgent need for the United States to attain energy independence. Transit use already saves the U.S. 4.2 billion gallons of gasoline each year, the equivalent of more than 11 million gallons per day. That amount of savings is equivalent to oil refined from 102 supertanker loads, or more than three times the amount of oil we import from Kuwait each year.[4]

- **Public transportation contributes to the growth of a strong economy.**

For every $1 billion in Federal investment in transportation infrastructure, the U.S. Department of Transportation estimates that approximately 35,000 jobs are created. Federal investment in public transportation also greatly supports American manufacturing jobs. Every transit bus or rail car that is purchased with Federal assistance is assembled domestically and comprised of components that are produced primarily in the United States, in accordance with "Buy America" policies established by Congress. In recent years, transit systems have increased their procurement of clean and alternative fueled buses, including diesel-electric hybrid buses and compressed and liquid natural gas (CNG and LNG) buses. The rapid growth in sales of these vehicles has put thousands of workers into new "green-collar" jobs that cannot be sent overseas.

According to researchers at Cambridge Systematics, it is estimated that every $10 million in capital investment in public transportation yields $30 million in increased business sales, and that every $10 million in operating investment in public transportation yields $32 million in increased business sales. Further, every $1 taxpayers invest in public transportation generates $6 in economic returns.[5]

- **Public transportation reduces traffic congestion.**

Traffic congestion results in lost time and wasted fuel. According to the Texas Transportation Institute report, congestion cost America $78 billion in lost time and productivity in 2005. Public transportation saved 541 million hours in travel time and 340 million gallons of fuel. Without public transportation, congestion costs faced by American motorists that year would have been $10.2 billion higher.[6]

These are simply a few of the many benefits that public transportation investment and use provide. Many more benefits could be detailed: Transit also provides important public health benefits—its service produces 95 percent less carbon monoxide and 90 percent less in volatile organic compounds than private vehicles; transit improves safety—fatality rates for travel on public transportation vehicles are about 1/25th that of private passenger vehicles; and transit offers vital mobility to older Americans and persons with disabilities. Each of these benefits are important, and deserves attention, but possibly a more pressing issue is that U.S. transit providers cannot meet the current demand for their services.

Current Investment Fails to Meet Demand for Transit Services

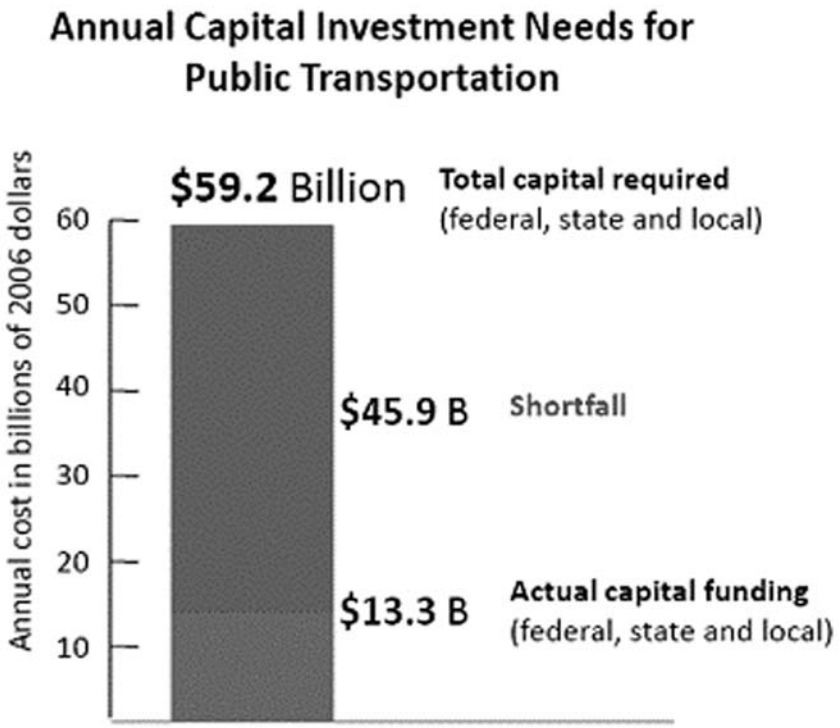
The greatest challenge facing public transportation today is meeting the record-breaking demand for transit services. We have witnessed sweeping changes in American travel patterns in 2008 in response to rising fuel prices, and public transportation is playing a key role in helping individuals escape the heavy burden of $4 a gallon gasoline while preserving the mobility we have all come to expect. In the second quarter of 2008 as the price of gasoline rose steadily, Americans took more than 2.8 billion trips on public transportation vehicles. This is almost 140 million more trips than last year for the same time period or 1.5 million more each day. As ridership has increased, transit services across the country are operating at capacity during peak travel times. Transit providers are struggling to maintain the quality of their physical infrastructure and the reliability of their service. Eighty-five percent of public transit systems report capacity problems, and 39 percent report turning passengers away because of capacity issues, according to a new

[4] ICF, 2008.
[5] Cambridge Systematics, "Public Transportation and the Nation's Economy," October 1999.
[6] Texas Transportation Institute, 2007 Annual Urban Mobility Report, September 2007.

nationwide survey of 115 transit systems of all sizes across the Nation recently conducted by APTA.[7]

It should be noted that transit ridership has been growing robustly in recent years. Last year, 10.3 billion trips were taken on U.S. public transportation—the highest number of trips taken in 50 years. Public transportation use rose 32 percent between 1995 and 2007, a figure that is more than double the growth rate of the population (13 percent) and up substantially over the growth rate for the vehicle miles traveled (VMT) on our Nation's highways (24 percent) for that same period. In fact, in recent months growth in transit ridership has accelerated while use of our highways has fallen. Transit ridership grew by more than 5.2 percent in the second quarter of 2008, while the Federal Highway Administration (FHWA) has reported that the vehicle miles traveled on our Nation's roads declined by 3.3 percent.

Despite the growth of the Federal transit program, Federal funding has not kept up with the growing needs or inflation. U.S. transit systems need nearly $60 billion a year in capital investment to improve and maintain transit infrastructure at a rate that would allow ridership to double in 20 years. The Federal Government traditionally provided approximately 50 percent of the capital investment in transit, but that share has shrunk. In 2006, the most recent year reported, the Federal Government provided 43.6 percent. As we move ahead, the Federal Government needs to invest upwards of $30 billion a year to support vibrant transit service across the Nation, significantly more than the $10 billion a year that it currently provides.



Source: Cambridge Systematics, "State and National Public Transportation Needs Analysis," 2008.

As this Committee knows, the resources of the Federal Highway Trust Fund are being exhausted rapidly. APTA strongly supported the trust fund "fix" that Chairman Rangel sponsored and President Bush signed into law this week. That legislation remedies the short-term crisis facing the Federal Highway Trust Fund without damaging the Mass Transit Account of the Trust Fund, but it does not address the larger issue of underinvestment in our Nation's surface transportation system, par-

[7] APTA, "Rising Fuel Costs: Impacts on Transit Ridership and Agency Operations—Survey Results," September 2008.

ticularly underinvestment in public transportation. Congress now has more time, but not much time, to address the long term funding need as the current Federal-aid highway and public transportation programs expire in 1 year on September 30, 2009.

When Congress develops a new surface transportation authorization bill, we urge this Committee to finance an aggressive program that provides no less than $123 billion in Federal public transportation investment over 6 years and restores the purchasing power of the Federal motor fuel tax. There has been no increase in the motor fuel tax since 1993, and inflation has steadily eroded the purchasing power of the revenues that go into the highway trust fund. The effects of inflation have been compounded in recent years by steep increases in the cost of construction materials. According to the Associated General Contractors of America (AGC), the cost of supplies for transportation infrastructure construction have increased 77 percent in the past 5 years, a much faster rate of growth than the consumer price index (CPI) which increased 19 percent.

For the Federal Government to begin to invest upwards of $30 billion a year in public transportation, the Congress will need to look to new sources of revenue, and given the contributions of public transportation to reducing emissions, climate change legislation should be one potential source.

APTA Recommendations for Federal Climate Change Legislation

- **Use revenues from Federal climate change legislation to expand public transportation service across the Nation.**

As Congress develops climate change legislation, it must move to protect, preserve, and most importantly expand public transportation service across the Nation. To achieve the increases in transit ridership that will significantly reduce greenhouse gas emissions from the transportation sector, climate change legislation must begin to address the $45.9 billion annual capital funding shortfall for public transportation. Revenues from the auction or sale of emissions allowances under a "cap and trade" program or forms of revenue from an emission reduction program should be used to supplement—not substitute—funding provided through the Federal highway and public transportation authorization legislation.

- **Increase the availability of fixed guideway transit—subway, light rail, commuter rail, streetcar and bus rapid transit—which is essential to creating energy efficient land-use patterns that reduce greenhouse gas emissions.**

Fixed guideway transit investments are essential to creating energy efficient land use patterns which produce greenhouse gas emission savings far beyond the immediate benefit of increased public transportation use. These investments have the potential to significantly improve the way we live and travel, reducing our individual carbon footprints while preserving and enhancing our mobility. Experience has shown that once fixed guideway transit investments are committed and station locations set, the private sector will build transit-oriented developments which produce dramatic reductions in vehicle travel and transportation-related emissions.

- **Promote energy efficient technology in public transportation systems to increase the already substantial CO_2 savings from transit.**

Climate change legislation should encourage new investment in energy efficient technology that can increase the annual CO_2 savings from current public transportation services. Federal support for such investment would speed the deployment of advanced technologies, increasing CO_2 savings and simultaneously reducing the cost of transit operations, thereby freeing up resources to support expanded service. These investments would also put more Americans to work in new "green-collar" jobs because all transit vehicles purchased with Federal resources are manufactured domestically.

- **Support local, regional and State efforts to increase mobility while reducing emissions from the transportation sector.**

As part of a comprehensive strategy to reduce greenhouse gas emissions, APTA supports the creation of a new source of funding for local, regional and State governments to advance mobility in ways that reduce the need for motorized vehicle travel. New funding could be linked to new performance-based goals and planning efforts that will capture maximum emission savings through the energy efficient land-use patterns, expanded transit availability and transit-oriented development. A new pool of funds at the regional and local level, when combined with a significant new investment in dedicated funding for public transportation infrastructure and oper-

ations, would offer communities the full complement of tools they need to fight congestion and expand mobility while simultaneously reducing greenhouse gas emissions from the transportation sector.

- **Equalize and expand tax benefits for public transportation riders.**

Finally, while understanding that the focus of this hearing is on global warming legislation, I would be remiss if I did not mention two legislative proposals under this Committee's jurisdiction that would increase transit ridership. H.R. 1475, the "Commuter Benefits Equity Act," introduced by Representative James McGovern, would increase the transit benefit offered under section 132(f) of the Tax Code to $215/month, the same level as parking. A Transit Cooperative Research Program study found that employee transit and vanpool ridership generally increases by 10–50 percent at worksites after the commute benefit program is introduced. Similarly, H.R. 6030, the "Commuter Act of 2008," introduced by Representative Mark Kirk, would establish a small tax credit for those employers who subsidize their employees commutes on public transportation. These two legislative proposals are cost effective remedies to increasing transit ridership and reducing greenhouse gas emissions, and I would urge this Committee to take action on these proposals as soon as possible.

Conclusion

Mr. Chairman, APTA applauds the attention of this Committee to the pressing issue of climate change, and we thank you for considering the contribution of public transportation toward reducing greenhouse gas emissions from the transportation sector. We look forward to working with the Committee as it explores these issues further in the months ahead.

Chairman RANGEL. We will be looking forward to working with you, because we need your ideas, especially in transportation, public transportation.

Now we will hear from Dr. Kreutzer of The Heritage Foundation. We look forward to your testimony.

STATEMENT OF DAVID W. KREUTZER, PH.D., SENIOR POLICY ANALYST, THE HERITAGE FOUNDATION

Mr. KREUTZER. Mr. Chairman, I want to thank you and the other Members for this opportunity to address you on the topic of climate change. My name is David Kreutzer, I am the Senior Policy Analyst in Energy Economics and Climate Change at The Heritage Foundation. The views I express in this testimony are my own, and should not be construed as representing any official position of The Heritage Foundation.

What is the problem with carbon dioxide, or CO_2? Carbon dioxide is not a toxin, it is not directly harmful to human health, and it is not projected to become so, even without legislative or regulatory action. CO_2 is fundamental to all known forms of life. Indeed, studies show that increased CO_2 levels are beneficial for crop production.

However, higher CO_2 levels are expected to have negative effects, due to temperature increases that some predict will be brought on by these higher levels. If the negative effects of CO_2 increases outweigh the positive, the question becomes, what are the benefits of limiting CO_2 emissions, and how do these benefits compare to the costs?

Some have made estimates of all the damage that global warming will do, and preset them as the benefit of reducing CO_2 emissions by some amount. Often called "The cost of doing nothing," this approach has two fatal flaws. First, the estimate costs, such

as the property damage from higher sea levels or crop loss from drought, are based on a world that is richer, in large part, because of the energy use that supposedly causes the projected sea level rise or drought.

The sea level rise affects more expensive buildings, and the drought reduces crops that are worth more because the world is richer. That is, the cost of doing nothing is an impossible cost to avoid, since the magnitude of the damage depends on the much richer world that energy use will create.

Using similar logic, I could consider my $6 per day Metro commuting expense the cost of work, and then estimate I would be $120 per month richer if I didn't go to work. Of course, that would be a silly exercise.

The second fatal flaw occurs when the total estimated cost of global warming is compared to the cost of reducing a small, often insignificant portion of that warming. Sticking with the previous analogy, it would be comparing the $120 per month commuting cost to the salary lost by staying home 1 day per month. The lost day's salary needs to be compared to the $6 saved from not commuting 1 day, not to the whole month's commuting cost.

So it is with proposals for carbon tax or a cap and trade scheme. We need to look at the cost of these proposals, in light of what difference the proposals make.

None of the proposed cap and trade schemes or carbon taxes, or any program that I have seen will entirely eliminate predicted climate change, regardless of the assumptions, the models, computers, or theories used. There are still going to be some emissions of CO_2. We will not cut it all.

As documented in our report, which is attached, we find that a cap and trade program like Senate Bill 2191, the Lieberman-Warner bill, will, in just the first 19 years—which is as far as our analytical models could go—in the first 19 years, reduce overall employment—overall employment—by up to 900,000 jobs in some of those years, reduce manufacturing employment by nearly 3 million jobs.

Again, in just 19 years, reduce gross domestic product by nearly $5 trillion, after adjusting for inflation. Of course, as has been mentioned, energy prices will go up. For example, gasoline will go up $1 a gallon above what it otherwise would have been.

These losses occur after consumers, workers, and businesses have adjusted as well as they can to the higher energy costs. Household energy prices rise, even though consumers will have switched to smaller cars, live in more energy-efficient houses, and make greater use of public transit. Job and income losses occur, even though firms will have adopted more energy-efficient technologies and processes.

In addition, cap and trade proposals include well-intentioned provisions to protect domestic industries. Unfortunately, these provisions promised to create unwieldy bureaucracies, trade tensions, and the possibility of damaging trade wars.

How much difference will all this make to world temperatures? Depressingly little.

The environmental gain for all the costs is unlikely to exceed a fraction of a degree by the end of this century. The Environmental

Protection Agency analyzed the impact of a 60 percent cut in CO_2 emissions, and found that it would reduce concentrations of CO_2 by about 25 parts per million. This would lead to a temperature drop of about .1 to .2 degrees centigrade.

The EPA did outline a scenario that would cut temperatures by a more significant 1 to 2 degrees, but this scenario required the developing world, including India and China, to reduce emissions to a level that would be equivalent to a 90 to 95 percent cut for us. We cannot expect these countries to condemn themselves to such income-killing reductions. So, we are back to the .1 or .2 degrees saved.

In sum, the cap and trade proposals impose significant costs for very little change in global warming. I am done.

[The prepared statement of Mr. Kreutzer follows:]

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

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

Mr. Chairman, I want to thank you and the other Members for this opportunity to address you on the topic of climate change.

What Is the Problem With Carbon Dioxide (CO_2)?

Carbon dioxide is not a toxin, is not directly harmful to human health, and is not projected to become so—even without legislative or regulatory action. CO_2 is fundamental to all known forms of life. Indeed, studies show that increased CO_2 levels are beneficial for crop production.

However, higher CO_2 levels are expected to have negative effects due to temperature increases that some predict will be brought on by these higher levels. If the negative effects of CO_2 increases outweigh the positive, the question becomes: What are the benefits of limiting CO_2 emissions and how do these benefits compare to the costs?

Costs and Benefits

Some have made estimates of all the damage that global warming will do and present them as the benefit of reducing CO_2 emissions. Often called "the cost of doing nothing," this approach has two fatal flaws.[1] First, the estimated costs (such as the property damage from higher sea levels or crop loss from drought) are based on a world that is richer, in large part, because of the energy use that supposedly causes the projected sea-level rise or drought. The sea-level rise affects more expensive buildings, and the drought reduces crops that are worth more per bushel because the world is richer.

That is, the "cost of doing nothing" is an impossible cost to avoid since the magnitude of the damage depends on the much richer world that energy use will create. Using similar logic I could consider my 6-dollars-per-day Metro commuting expense "the cost of work" and estimate I would be $120 per month richer if I didn't go to work. It is a silly exercise.

The second fatal flaw occurs when the total estimated cost of global warming is compared to the cost of reducing a small, often insignificant, portion of that warming. Sticking with the previous analogy, it would be comparing the $120 per month commuting cost to the salary lost by staying home 1 day per month. The lost day's salary needs to be compared to the 6 dollars saved, not to the whole month's commuting cost.

So it is with proposals for a carbon tax or a cap and trade scheme. We need to look at the cost of these proposals in light of what difference these proposals make. None of the proposals will entirely eliminate predicted climate change regardless of the assumptions, models, computers or theories used.

[1] For instance see: Frank Ackerman, et al., "The Cost of Climate Change: What We'll Pay if Global Warming Continues Unchecked," 2008, Natural Resources Defense Council. Accessed on September 7, 2008 at: http://www.nrdc.org/globalwarming/cost/cost.pdf.

The Costs

The typical cap and trade proposal seeks to reduce CO_2 emissions by 60 percent to 80 percent by 2050 where the comparison year is usually 2005. The Center for Data Analysis at The Heritage Foundation did an analysis of the costs of meeting the goals of the Lieberman-Warner bill, S. 2191, this past spring. The report on this analysis is attached.[2]

Our analytical models are not suited to making projections beyond 2030. Nevertheless, the costs of S. 2191 just in the first 19 years were eye-opening. The estimated aggregate losses to Gross Domestic Product (GDP), adjusted for inflation, are $4.8 trillion. By 2029, the job losses in the manufacturing sector will be nearly 3 million. This is over and above the significant manufacturing job losses that most economists predict will occur even in the absence of global warming legislation.

Some of the workers forced out of manufacturing will find employment in the service sector but overall the economy loses jobs. In some years this overall job loss exceeds 900,000.

Eighty-five percent of our energy use today is based on CO_2 emitting fossil fuels. The ability to switch to non-CO_2-emitting energy sources over the next 20 years is limited and expensive. Therefore, significant cuts in CO_2 emissions require significant cuts in energy use.

The cap and trade schemes, as well as carbon taxes, limit emissions by making energy more expensive. In addition to having a direct impact on consumers' budgets for gasoline, heating oil and natural gas, these higher energy costs force cutbacks on the production side of the economy and lead to lower output and income.

These losses occur after consumers, workers and businesses have adjusted as well as they can to the higher energy costs. Household energy prices rise 29 percent above the business as usual prices, even though consumers will have switched to smaller cars, live in more energy efficient houses and make greater use of public transit.

Production drops even though firms will have adopted more energy efficient technologies and processes. To reiterate, the trillions of dollars of lost GDP and the hundreds of thousands of lost jobs occur even after homes and businesses have made the switch to greener ways of doing things. The hoped-for green-job gain is a mirage.

Cap and trade programs frequently include provisions to protect domestic industries from competition with firms in countries that haven't adopted similarly costly mechanisms for reducing CO_2. While the intent is certainly understandable, the provisions create the possibility of a protectionist wolf in global warming clothes.

While the theory of this trade-protection makes sense, putting it into operation is a bureaucratic nightmare. Every product from every country will need to be judged for how much of an advantage it may have due to different carbon-cutting regimes. Since different countries can have different approaches and since different manufacturers can use different technologies and processes, assigning an offsetting CO_2 tariff will necessarily involve arbitrary decisions. The potential for a trade war is very real.

Note: Current law already has many provisions for curtailing CO_2 emissions. They range from local renewable-fuel mandates to increased nationwide Corporate Average Fuel Economy (CAFE) standards to subsidies for ethanol production. While the reductions in CO_2 emissions are included, the considerable cost of these programs is not included in our analysis. This is because the costs are attributable to existing legislation and will occur even without additional laws or regulations. Of course, if they were included, job and GDP loss totals would be even higher.

The Gain

Analysis by the Environmental Protection Agency (EPA) shows that a 60 percent reduction in CO_2 emissions by 2050 will reduce CO_2 concentrations by only 25 ppm in 2095. This reduction would affect world temperatures by 0.1 to 0.2 degrees C. In other words, it makes virtually no difference.

Some argue that if the United States adopted a sufficiently severe cap on CO_2 emissions that would induce the rest of the world to do the same. The same EPA analysis runs through just such a scenario and finds with the "leadership" effect the drop in CO_2 concentrations are larger—perhaps enough to reduce world temperature by 1–2 degrees C.

However, the assumptions made to achieve even this reduction are entirely unrealistic. It is assumed that our leadership causes the developed world to reduce their

[2] William W. Beach, et al., "The Economic Cost of the Lieberman-Warner Climate Change Legislation," Center for Data Analysis Report #08–02. http://www.heritage.org/Research/EnergyandEnvironment/upload/cda__0802.pdf.

emissions by 50 percent by 2050 and that the developing world would cut its emissions to the 2000 level by 2035.

Seeing what that means for just two countries, India and China, illustrates how unlikely it will be to meet that goal.

In 2000, China's CO_2 emissions per capita were about 2 tons per year. In India the 2000 per capita emissions were barely above 1 ton per year. Currently the U.S. emits about 20 tons. With no population growth, a 70 percent cut would bring us down to about 6 tons per capita per year. Expecting China and India to cut back to levels that are ⅓ or ⅙ of ours is unrealistic. Even holding them to our limit of 6 tons per capita would cause their emissions to grow more than enough to offset our 70 percent cut. The rest of the developing world would be no more inclined to abide by similarly stringent limits.

The Tax

Implementing a cap and trade program to cut emissions by 70 percent creates a transfer within the United States that is equivalent to taxes on the order of $250 billion to $300 billion per year, just for the years 2012 to 2030. This takes the purchasing power from the households and turns it over to the Federal Government or to whomever it assigns the rights to permits for emissions (allowances). This would be one of the largest taxes in the economy—almost twice as large as the highway use taxes.

Conclusion

The legislation analyzed seeks to cut CO_2 emissions by 70 percent. This cut will have little impact on global temperatures but even the 30 percent cut that we analyzed will reduce incomes, raise taxes and destroy jobs. The true comparison is trillions of dollars in lost income and hundreds of thousands of lost jobs vs. a fraction of a degree change in average world temperature 85 years from now.

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Chairman RANGEL. Thank you. Before I ask Mr. McCrery to kick off the questions for the Committee here, we are very anxious to make certain that we have prepared a way to give this some type of priority for the next Administration.

We have an unusual situation, where both of our candidates are supporting cap and trade. But in listening to most of the testimony today, I find that I may be facing next year, if McCain is not the President, some type of a split along party lines—for sincere beliefs, not because of polarization—but because of differences in thought as to the damage that would happen to our country and the planet if we don't do anything, and seemingly, from the ques-

tions I heard from the minority, a concern about moving forward could possibly wreck our economy and the manufacturing industry.

My question is, in a very generic way, as you go out selling your position, is there a tendency that one party or the other is more solid in support of your position? I hesitate to ask Heritage Foundation, because I am afraid I would know the answer there, just because of who is doing the research.

But I will start with you. Do you find many Democrats supporting your position, as you speak and write and discuss this?

Mr. KREUTZER. We have not been invited by many Democrats to brief them.

Chairman RANGEL. I see.

Mr. KREUTZER. So, I don't know what they support.

Chairman RANGEL. Well, that takes—well, it's probably the reputation of the Foundation, rather than the scientists out there.

Generally speaking, has anyone felt that the concern is bipartisan? Can I get a—yes?

Mr. BARNES. Yes. I would say, with regard to a revenue-neutral cap and dividend, that it has support on both sides of the aisle. It appeals to liberals, because it protects low-income families, and middle-class families, and it also has appealed to conservatives, because it's revenue-neutral and it's market-based.

So, in the Senate, for example, when Lieberman-Warner was being debated, Senator Corker introduced an amendment, which was essentially to give all the money back to the people, on a per capita basis.

I would also mention that in Alaska, Governor Palin recently increased the taxes on the oil companies, and distributed that revenue in the form of a $1,200 dividend to all Alaskans. This is an addition to the regular dividend that they get from the permanent fund, in order to offset the higher energy prices there.

So, I think this approach does have that appeal that cuts across——

Chairman RANGEL. Your approach?

Mr. BARNES. Yes.

Chairman RANGEL. Yes.

Mr. BARNES [continuing]. Cuts across party lines.

Chairman RANGEL. Others have any comment to make?

Mr. ABBASI. We would be pleased to provide you with polling that I have seen over the last few years that has shown that there is a partisan gap, a significant partisan gap, on this issue. Unfortunately, a higher proportion of Democrats have been concerned about it, and urging government action, than Republicans.

Our firm, MissionPoint, is bipartisan. And, we're prepared and anxious to work with Members from both sides of the aisle to fashion a solution that will work. We need champions on both sides. We would be able to supply you with some polling data that we have seen that supports what you are saying about a partisan gap.

Chairman RANGEL. Well, these meetings—not to say it's unfortunately—but many people are just not educated on looking at this on both sides. But we do know that it's a serious problem, and that we may both have to make compromises.

But I am pleased to see that, the way the testimony is coming, the questions are coming from the Committee, and we may not have the problem that I guessed we might.

Let me yield to Mr. McCrery.

Mr. MCCRERY. Thank you, Mr. Chairman. Were all of you here earlier today for the first panel? You heard their testimony and our questions?

I was actually—I was telling the Chairman, I was actually pleased that there seemed to be somewhat of a consensus among the panel that there were, indeed, some pitfalls, if you will, of a cap and trade approach to global climate change. They seemed interested, and anxious, even, to come up with ways to address those pitfalls, particularly, I guess, with respect to energy-intensive industries here, in the United States.

I was just wondering if you all share the—what I believe was the conclusion of the first panel, that yes, we do need to take some measures within the cap and trade structure to address the potential loss of jobs and energy intensive industries here, in the United States. You can just go down the line, if you would like.

Mr. ACKERMAN. I think that we certainly need to look at what the real job effects will be. I think that there have been wildly differing estimates. We have heard so many times in the past that one environmental proposal or another will cause humongous job losses, we need to look very closely at what's the basis for that being projected, once again.

There are groups, like coal miners, who certainly will be affected by any effective carbon policy. We need to look at the compensation of them, whether that's through the cap and trade program, or not.

I also wouldn't say that the cap and trade program is the only thing we need to do. The point of my testimony is that it's urgent to get going on carbon reduction, whether through this method or through some other.

Mr. MCCRERY. Thank you.

Mr. ABBASI. My understanding is that the average energy cost, the proportion of the average manufacturing company's overall cost structure that is energy is about 2 percent. But it is higher for a handful of industries, and that for those industries, in some of the pending legislation like the Lieberman-Warner bill, there is a proposed adjustment: A requirement that an importer would surrender an allowance for imported goods, on a one-to-one basis for carbon content. This would be intended to level the playing field if we have a cap, and we are importing from an uncapped country.

There is also a provision in that bill that says that the adjustment would have to account for the different developmental levels of the country from which we're importing. In prior testimony I gave to the Select Committee on Energy Independence and Global Warming in April, we proposed a way to think about a formula like that, which would be an adjusted kind of index that would account for emissions per capita, as well as emissions per unit of GDP.

Our emissions per capita, of course, are much higher than, for example, China's, but their emissions per unit of GDP, as I think was pointed out earlier, is significantly higher, I think four to five times. So, some sort of index that would basically allow the surrender of less than a one-for-one allowance for an import from that

country, based on allowing developing countries additional head room to grow is a model that we believe would be fair. It would reflect the fact that, at this point of the cumulative emissions in the atmosphere, the United States accounts for about 30 percent.

So, I think it's fair and equitable to say that we in the U.S. need to take the first step. It is also important to recognize the competitiveness impacts you're talking about. But if we're going to have a requirement like that at the border, let's adjust it in a fair way to allow some of that development head room.

Mr. MCCRERY. Good. Thank you.

Mr. RINGO. Representative Artur Davis this morning, of Alabama, brought up a very interesting point and an interesting concern about an industry in particular in his State that might fall vulnerable to a cap and trade system.

At the Apollo Alliance, we believe that if the overall moneys that are going to be generated from such a system are properly reinvested in training, in making sure that the playing field is level for those people that have been disproportionately impacted, the impact would be a lot less, with respect to the loss of jobs.

If we invest in training people for this new green economy, if we invest in training people for these new green jobs, those that lose their jobs will gain new jobs, new training. That's why Apollo Alliance is a huge alliance, and we are engaged very much with the labor community, with the conservation community, because we believe that this whole 10-year, $500 billion investment strategy that we are promoting is a win-win-win-win for all Americans.

Now, I am sure that there will be some casualties along the way. But I believe that, with proper management of the program, that those numbers would be minimized.

Mr. MCCRERY. Mr. Chairman, my time is expired. I didn't get to hear from everybody on the panel, but I think—I don't hear any dissonance there, particularly, so I am pleased that we are all at least looking to try to create a system that does not unduly harm the economy, and destroy jobs.

Mr. DOGGETT [Presiding]. Thank you, Mr. McCrery. I ask for your advice in trying to perfect the Climate Matters bill before turning to Mr. Herger for his questions to you.

Let me begin with you, Mr. Abbasi, because I am pleased about your response to Mr. McCrery about the bipartisan nature of this. You know, we talk about the Lieberman-Warner bill. Certainly Senator Warner, a distinguished conservative Republican whose career has been built around national security, recognizing the security implications of this, I want, as I said at the outset in introducing my bill, to have strong bipartisan participation in it. But at the same time, much like the science, we can't wait until we get 100 percent of the scientists, including those who may work for industries who have a stake in doing nothing, to come aboard, because the needs are so great to move now.

Let me ask you if, based on your experience, you believe we are already beginning to lose competitiveness and lose some jobs as a result of not moving forward on climate change. An aspect of that that Ms. Browner did not have a chance to respond on, whether the uncertainty that business has about what might or might not hap-

pen, how comprehensive a cap and trade bill will be, if that is affecting investment, and where people choose to invest now.

Mr. ABBASI. Thank you, Mr. Doggett, and thank you for your leadership in introducing that very important bill. We look forward to working with you on it.

Yes. Our belief, from our experience in the market, is that, in fact, the other countries—I am going to talk about Europe for a moment—have provided a much more conducive environment for clean energy companies.

We founded our firm with a strong U.S. focus, but we are going to be opening an office in London, and we are doing due diligence right now on transactions in Europe. There is a strategic understanding of how big this opportunity is in Europe. Obviously, they have launched the European trading system for carbon, and they also have very, very supportive regimes to directly stimulate renewable energy in a number of countries.

I mentioned Germany earlier. Let me say that what's so difficult to watch, what's painful to watch, is that a number of the most innovative companies are originally from the United States. So, I mentioned that Europe—Germany has a large installed base of solar power using the traditional crystallline and silicon flat plate technology. But thin film is the next generation, thin film technologies.

So, companies like First Solar, which are U.S. companies, are now out, installing their manufacturing facilities—again, high-tech manufacturing—in other countries. First Solar plans to build 1,100 megawatts worth of production capacity by 2009. That's a lot of solar. It accounts for about $864 million in investment. And 87 percent of that is going to be in Germany and in Malaysia.

So, we see an instance where, again, companies with original U.S. technology, next generation technology, are moving their production facilities abroad. We should be bringing those jobs here, home.

Mr. DOGGETT. Thank you. Mr. Barnes, the cap and divided approach that you suggest certainly does have the advantage of simplicity. As you know, in the legislation that I introduced, I envision some income transfer, especially to those Americans at the bottom of the economic scale who will face the greatest burden here, as they will face the greatest burden if we don't resolve climate change.

That's not the only thing that I do with the auction revenues, and one of the areas that I focus on is health care. Is health care a way of providing a direct benefit of the type that you envision, even though it's not necessarily putting a check in the mail?

Mr. BARNES. Yes, I think health care meets the test, if you will, that the auction revenues be used for a public benefit that is basically universal, and that particularly benefits low- and middle-income families.

So, I would say I would be very sympathetic to some of it being used for health care. But I would caution not to take that too far. The moment you start doing this, that, and the other thing, I think you then run into the whole Lieberman-Warner sort of sandpit.

Mr. DOGGETT. Thank you. Mr. Ringo, we have already heard in testimony from others about the danger of seeing jobs go overseas.

The type of jobs that would be created under a cap and trade system, which put a premium on clean energy and energy efficiency, how likely is it that those kind of jobs will ever be exported abroad?

Mr. RINGO. Well, I think that if we invest in America, invest within our communities, we have programs, we have legislation being passed in our State legislatures around the country, 27 States have passed renewable portfolio standards that are requiring that a certain amount of energy in those States be produced, be alternative energy.

For example, in the State of Pennsylvania, where Gamesa came in from Spain, brought those jobs into Pennsylvania because of that portfolio standard, and created 1,000 jobs. Those are homegrown jobs. Many of those people were people that were laid off from the steel industry.

I met a gentleman at the Democratic Convention recently who was a laid off steel worker who was rehired by Gamesa when Gamesa moved into Pennsylvania. Those are jobs that are going to be homegrown. With proper investment and subsidizing some of these companies, to encourage them to invest in alternative energy, it can really stimulate the economies at home, and guarantee that those jobs remain within our communities.

Mr. DOGGETT. Dr. Ackerman, your study, the written study you had, tends to focus on the cost of inaction that will result from weather changes, primarily. Are there not also—and you refer to some of these in your oral testimony—a long list of changes and costs that will occur, such as on health care, that would be in addition to the cost that you outline in your written testimony.

Mr. ACKERMAN. That is right. I emphasized in writing, particularly, that this is a partial accounting of the cost of inaction. There will be increased health care costs, as weather extremes are obviously bad for health—there are a number of studies of that.

There will be worse effects on agriculture. More and more research has undermined what people believed 10 or 15 years ago, that warmer weather would be good for crop yields. It's increasingly not supported by recent research. Stormier and hotter conditions, and drier conditions in a lot of places would be bad for agriculture.

The tourism effects which we were able to estimate for Florida, but not for the country as a whole, certainly outdoor activities that are dependent on the weather, like tourism, will be devastated by some of the changes that are being looked at.

The list goes on and on. How do you value the changes to parks, to wilderness areas, natural ecosystems? There are many, many costs which are not included in the kind of estimates I produced.

Mr. DOGGETT. Finally, you opened your testimony by saying that there was broad consensus on the science that we have.

Mr. ACKERMAN. Yes.

Mr. DOGGETT. We know it's not universal, from the questions that Mr. Linder asked earlier, and that we are never going to get 100 percent agreement on science. Maybe even people still debating about tobacco and its effect on health.

But tell me, as it relates to the economics, do you perceive that there is, if not a total consensus, a growing view among economists

that the cost of a properly designed response to climate change is less than the cost of inaction on climate change?

Mr. ACKERMAN. I don't think we have reached the level of consensus that scientists have, where—what I've said about the climate debate is that science is I think it's something like 3,000 to 5 now. We are not at that level, but there is a steady movement in economics, there are more and more people who have moved that way.

The Stern review, Sir Nicholas Stern, who is one of the most prominent members of the British government in these areas, and formerly Chief Economist at the World Trade Organization, that study was really path-breaking, in suggesting that conventional economic calculations showed that the worldwide costs of inaction, are very large, much greater than my U.S. estimates: Worldwide, 5 to 20 times the cost of action. That has certainly moved the debate quite a ways.

Mr. DOGGETT. Mr. Millar, thank you for your comments about the bill. I think Mr. Blumenauer will have a few more questions about infrastructure. Mr. Herger.

Mr. HERGER. Thank you very much. I am enjoying our panelists, I appreciate each of you.

Again, I would like to bring back the perspective that it was just 30—let's see, 38 years ago, in 1975, the headline of Newsweek Magazine was global cooling. Just a year before that, the headline on Time was, in 1974, global cooling. We know we have gone through several ice ages, we know that we are—you know, it's not like we don't ever change here. We do. So, I think it's very important we have everything in perspective.

Now, the fact that we have all of what we're doing, obviously, we have to have an effect on the environment. I think whatever we do, we need to do where we don't overact and bankrupt our society at the same time. I think that, hopefully, that is the balance, Mr. Chairman, that we are going to have with this very important hearing that we are having today.

So, again, getting around to the cost of this, knowing that we are now being surpassed, and not just by a little bit, but overwhelmingly surpassed here in the years to come by China and the greenhouse gases they're going to be emitting, and India and others, that we not cut off our nose to spite our face, that we be involved.

But, you know, I get the feeling, just listening, that boy, we have to somehow think we can do it all here, shoulder all the expenses, for what might end up being, as the doctor over here indicated, might be just a half a percent of climate change, perhaps.

So, again, I don't want to throw a damp towel on this, but I certainly hope and pray we have this in perspective. Just getting around to the cost, the cost that, at a time when our economy is down, when we're looking at doing what we can do, and knowing, particularly this Committee, Ways and Means, that we have entitlement cost problems ahead of us—Social Security, Medicare—I mean, these costs are something we need to be considering in putting them in the perspective, and whether or not we should be doing it in a way where we use a carrot and not a big, huge stick.

I so much am hearing this big, huge stick that's being promoted by so many, and that, quite frankly, more than a little bit concerns me, and I think concerns many, and should concern many.

With that in mind, I would like to ask a question of our panelists, that reducing these greenhouse gas emissions by the amount that is required in House bills H.R. 6186 and 6316 is going to be very expensive.

In June of this year, the United Nations International Energy Agency estimated that allowance prices need to be at least $180 per ton. This was their estimate, which is more than four times the prices in the EU today, more than four times what they are paying. An IEA Executive Director stated that, "Costs are going to be very steep."

Just how high do energy prices have to get to reduce greenhouse gas emissions by the amount in these House bills? I would be interested to hear estimates from our panelists. Dr. Ackerman.

Mr. ACKERMAN. I would like to respond to a couple of things.

Mr. HERGER. Please.

Mr. ACKERMAN. I don't have a number in my pocket for that last question. The question about the global cooling estimates from the 1970s, there used to be a lot more pollution in the air, and some of that pollution actually blocked some of the sunlight, so that it—this is not just a change in whims, this is a change in the science. We used to put a lot of crud that came out of the coal plants into the air, and that somewhat cooled the atmosphere down.

It also made people sick and killed forests and killed fish much more quickly than climate change does, so it was a big step forward for human and environmental health, to adopt the Clean Air Act, and take that stuff out of the air. The consequence of taking it out of the air is that it took away this perverse way in which we were slowing down global warming, so that that—you know, it's actually progress in dealing with acid rain that has led to that shift that you mentioned.

In terms of how much will it cost, I would—I noticed I was mentioned in Mr. Kreutzer's testimony—I would take exception to the way he used my numbers there, and particularly to this estimate that we would get only this tiny percentage reduction in the temperatures. That's if only the U.S. reduces emission, and nobody else does.

This is a global problem. The U.S., China, and Europe, each in round numbers, account for one-fifth of it, and the rest of the world for the other two-fifths. There is no possibility of a solution without cooperation, and it makes no sense at all to quote these numbers, based on the U.S. acting alone.

I will tell you, having spoken a little bit about this internationally, there is going to be no world solution without the U.S. taking a lead. It has been embarrassing to talk about this issue in Europe lately, because no matter what research you come there with, they only have one question for Americans, which is, "What are you thinking of, not doing anything about this? Why isn't the Bush Administration doing something about it?" There is only so many times you can say, "Well, I don't speak for the Bush Administra-

tion," without feeling a little embarrassed for your country, and not taking action.

Mr. KREUTZER. Yes, I would like to talk about the costs. First of all, we are sometimes portrayed as being to the right and having extreme numbers. There is a table on page 14 of our report that shows where our estimates of the allowance costs come in, compared to other people who have done similar sorts of estimates.

In 2030, our high end is $88 per ton of carbon dioxide. MIT, hardly a bastion of conservative thought, came in at $101. These are good ways to gauge where we fit in the mainstream of estimates of the cost of carbon dioxide restrictions. The EPA, their estimates were $83. Charles River Associates, a consulting firm, is $112. The much maligned and undeservedly maligned National Association of Manufacturers reports $85 to $227. The $227, which is the number you keep hearing, was with no offsets. That was a technicality. The Energy Information Administration had a range of $61 to $156 per ton. So, we are not in some extreme exaggerated position in estimating what the costs will be to the economy.

As far as the damage—the help done to CO_2 levels, how much temperature change there will be, yes, we could talk about bringing it around 2 degrees, if you get India to cut back to one ton per capita and no population growth by 2035. They simply won't do that. We will be having six. China will have to cut back to two. That was what the EPA estimated.

So, this is—and if you're going to talk about the cost of the whole world cutting back, we need to look at the cost to their economies, as well. You can't say, "Well, here is what it costs the U.S. to cut back 70 percent, and here is the benefit we get, it's only a tenth of a degree," and you say, "Well, the rest of the world has to cut back, too." Well, let's look at how much they're going to have to spend.

Mr. DOGGETT. Thank you. Mr. Larson.

Mr. LARSON. Thank you, Chairman Rangel, again, for putting this together. I thank the panelists for their forbearance, especially Mr. Abbasi, whom I know from my home State of Connecticut, and the great work that you have done, and the book that was prefaced by the "fierce urgency of now," quoting Dr. Martin Luther King, and how important that is.

The significance of this hearing, in as much as I think it's relatively clear—and certainly I respect people who dispute the science. We have people that don't believe in evolution. We have differences of opinion that exist in the U.S. Congress, and you have to allow for that respect and tolerance within the Committee process, as we do all across the United States.

But to—really, it comes down to a category of doing nothing, or doing something. I applaud my colleagues on this Committee, Lloyd Doggett and others, who have put forward legislation that deals with this issue. I also have put forward a proposal, along with Peter Stark and George Miller and Jim McDermott of this Committee. I serve with Mr. Blumenauer on a Speaker's Select Committee on Climate Change, Global Warming, and Energy Independence.

Mr. Sensenbrenner, in that Committee, says, "Look, whether you call it cap and trade, or whether you call it a carbon tax, we're

going to call it a tax. We are opposed to taxes, period, end of tape, end of discussion. That's how we're going to frame this issue."

So, we ought to be clear that, from the outset, that's how this issue is going to be framed if you don't favor doing something about it now. If you don't believe that there is the fierce urgency of now, and you don't believe in the science, then the opposition will be, "This is a tax, and we're against taxes."

So, once we get that issue decided, then you have to look at, well, you have a difference of opinion upon how we best solve this problem. I believe—and we just came from hearings today, meetings with regard to everything that's happening in the economy today. What the American public wants is us to level with them. None of them like taxes. I thought Mr. Bloomberg this morning was eloquent. Nobody likes to be taxed. But what are the problems that we face, and then level with us forthrightly about what we have to do.

So, to indicate to them—and, Mr. Barnes, I thought your proposal was interesting, as well—about taxing polluters upstream, so that there is a downstream benefit directly to the people, as in "We, the people," is the only way, if you put the science aside for a moment, that you can basically come to bipartisan agreement, in terms of this issue of taxation and money flowing back to the people who, surely, everyone agrees, will be impacted.

With regard to tariffs, and intensified industry, I thought those were excellent points, and again, commend the Chairman, because this is how you flesh out concepts and ideas of this nature.

I am a firm believer that what we have to do is level with the people and be unafraid about—and talk to them directly about—what it costs, and what we're going to have to do to achieve these goals, and what it means to them, their grandchildren, and our children, and the consequences of that, and then lay it out in a manner as succinctly and as clearly as we can, so that they understand those ramifications.

Now, what we give back to them, I believe, has to be direct relief for the consumer. Other ideas you can entertain. My concern with cap and trade is how we explain about these auctions that take place, and what happens at an auction, and how is it set up, and what will that bureaucracy do.

When you have a system that's already set up to deliver money directly back to the people, how can we—why isn't it—as Paul Volcker, as Alan Greenspan, as Al Gore, as Bill Bradley, and you can go down the list of economists and others have said—"Send the money directly back to the people, by way of payroll deduction." Join people in an effort that will preserve the environment that has a direct efficient way of getting the cost back.

Your response, from the panel?

Mr. RINGO. When you talk about getting it back to the people, as I mentioned earlier, I live and am from Louisiana, close to the State of Alabama. Louisiana is a State where oil and gas is king. One-third of the domestic oil supply comes off of our coast of Louisiana.

After Katrina hit in 2005 and Rita hit in 2005, and the two storms that have recently hit, people before that time were not talking about climate change. Many didn't believe that climate

change was real, because oil and gas was king, and that was just not an issue to discuss. I was in a shelter last week, evacuated from Hurricane Ike. The conversation in the shelter was—and these are people who are industry workers, and families of industry workers—were saying, "We've got a real problem out there with this global warming, because every storm that hits the Gulf of Mexico is a four or five."

Now, it is costing us in a big way, because of a lack of action. We have gone through several decades of missed opportunity in dealing with issues of global warming, and what have you.

Some people, as I oftentimes say, in Louisiana we suffer from category five storms and there are folks up here in D.C. and around the country who have been suffering from category five denial about global warming. But now people along the coast are waking up because they see the impacts. Now they are saying, "Do something, and do something now."

We have gone through these decades of missed opportunity. Now we're in a decade of last opportunity, because we've got to fix it. People now, along Louisiana, in Texas, are not thinking about the bail-out of AIG right now. We're in the middle of hurricane season. We're just halfway. They're just concerned about the next storm, and the fact that, if it hits the Gulf, it will probably be a four or five, and the impact will unfold as you have seen.

So, there is a sense of urgency down there, for sure, on do something about it, and do something about it now. At the same time, the majority of the people that are crying out, many of which are poor people who have already suffered the disproportionate impact by being the folks that live closest to the fence line of those industries——

Mr. LARSON. So, would they prefer a direct tax back to them from the revenues that are generated?

Mr. RINGO. If it is reinvested in their community to be a pathway out of poverty——

Mr. LARSON. I am talking about them personally, lowering their payroll taxes.

Mr. RINGO. I am sorry, sir. I didn't hear that.

Mr. LARSON. Lowering their payroll taxes directly to them.

Mr. DOGGETT. The Chairman is back, and I think Mr. Blumenauer is next.

Mr. LARSON. Thank you.

Mr. BLUMENAUER. Thank you. I appreciate your patience with this. I have found this to be extraordinarily interesting.

I have enjoyed working with Mr. Doggett on his proposal, although frankly, I have cosponsored Mr. Larson's. I am agnostic, in terms of how we deal with a price for carbon pollution, and being able to have some resources to redirect for the economic revitalization that you talked about. But Lloyd is right, I have some modest interest in this larger question of infrastructure.

We think about, in the short term, what is going to happen for water, in terms of supply, water development, protection, water treatment: extraordinarily expensive for systems that are already inadequate in much of America—72,000 miles of water main and sewer pipe over 80 years of age right now.

Problems of electric transmission, grid reliability, being able to get some of this alternative energy out from some of the remote areas of wind turbines, for instance, to the grid, being able to use some of the technology that I know we're developing to help people do a more efficient job, just in their own household.

Disaster—and I appreciate Mr. Ringo's reference to that—what we pay for the recovery from disaster, from prevention. This—it's gone up sixfold in the last three decades, and the loss from disaster is skyrocketing. All the indications are that it's going to get worse.

Last, but not least, transportation, what we're going to do to retrofit, to expand, to have a new fleet, to have new choices, new options, is not a cheap proposition. But it has embedded in it economic opportunities that are very substantial.

This comes at a time when our Chairman is going to have lots of people knocking at his door next term. We have the Highway Trust Fund that is going into deficit for the first time in history.

There are more people with their mouth open and their hand out for all sorts of schemes that are going to have to be paid for, as well as these notions of renewing and rebuilding.

I wonder if Mr. Millar, Mr. Abbasi, Mr. Ringo, if you could comment briefly—and this will be my last question, and I will be quiet—just about the merits and the opportunities of making some strategic investment in being able to not just meet our climate challenges, but just kind of hold the country together with the challenges that Dr. Ackerman is talking about, in terms of the stresses we're going to be facing with extreme weather events, change in temperature, rise in sea level.

Mr. MILLAR. The opportunities are certainly great, and I tried, in my testimony, to give a sample, across the board. While this hearing is specifically about greenhouse gas emissions and climate change, how we choose to solve that problem will have impact in so many other areas.

So, for example, in transportation policy, thinking about expanding the opportunity for choice to more Americans. The Census Bureau tells us that only about half the households in America have any choice at all, in terms of public transportation available. If we give people the choice, recent history has shown us if it's a good choice they will use it. We are seeing record growth in the use of public transit.

The interesting thing to me is it's not just in the big cities. In fact, two of the top three growth areas we're seeing are in communities of less than 100,000 and 100,000 to 500,000. Generally those are communities with not well developed public transit. It shows Americans are hungry for choice, and choice requires investment.

Mr. ABBASI. I want to commend you, Congressman Blumenauer, on your smart growth initiative. You know, you reference the importance of infrastructure. We will need less infrastructure, in terms of roads, if we're smarter in how we locate our homes.

One idea we promote in the testimony—it's similar to something you proposed is a location efficient mortgage, which provides a bonus for mortgages on homes that are located in a high density area that will cut down on our transportation need.

I want to mention one other example of infrastructure: smart meters. I don't know if anyone here has ever actually tried to decipher

their electricity bill, but it's very hard to understand the impact of the choices you make in your home on your energy bill, let alone to read and understand what's in that bill. Smart meters offer us an opportunity to, once and for all, understand that, to have an in-home display, where we can see the electricity usage of our various appliances.

Mr. BLUMENAUER. In real time?

Mr. ABBASI. In real time. There is good evidence that, when you do this, people make better, more informed choices—they will upgrade, they will invest in efficiency.

So, when we think about using some of those auction revenues, let's incentivize things like that, because that will allow you to actually see the new carbon price signal when we have one and respond to it.

Mr. BLUMENAUER. Thank you very much.

Mr. ABBASI. I will just give one other statistic. The average electricity bill in America was about the same in 2005 as it was in 1990, even though electricity prices were up about 24 percent. What that indicates is that we do get more efficient, and people do respond over time. So, prices and bills are different.

Mr. DOGGETT. Thank you. Mr. Pascrell.

Mr. PASCRELL. Thank you, Mr. Chairman.

Mr. Millar, most of us are advocates for public investment in transportation, public transportation. In my—in New Jersey, high gas prices are turning commuters to New Jersey Transit Commuter Rail Service.

As you point out in your written testimony, public transportation use reduces carbon dioxide emissions by more than 37 million metric tons every year in the United States. Am I quoting you accurately?

Mr. MILLAR. Yes, sir, you are.

Mr. PASCRELL. Well, then before I ask you this series of questions, let me ask Mr. Kreutzer this question.

Mr. KREUTZER. Okay.

Mr. PASCRELL. What do you think, since only 54 percent of American households use public—mass transportation—do you think that this is a wise thing to do, in reducing the amount of emissions? Very briefly, do you think this is wise, or is this cost foolish?

Mr. KREUTZER. It depends a whole lot on where you do it. I live in Arlington, I take transportation, the Metro. It makes a whole lot of sense there. I would be willing to pay more if they could have some more cars so I could sit down on occasion.

But I also lived in Dayton, Virginia, an old order Mennonite hub. We had horse and buggies. You could have put a subway at every one of their houses, they wouldn't have taken it.

Mr. PASCRELL. But you wouldn't object, therefore, to public investment into the kinds of things that you could accept?

Mr. KREUTZER. As with any public investment, I think I would want to look at the cost, versus the benefit.

Mr. PASCRELL. Well, we all would.

Mr. KREUTZER. Right.

Mr. PASCRELL. I don't think anybody on this panel or anybody on this side of the table would simply, you know, spend, regardless

of what the outcomes would be. We want to make sure it's effective and efficient.

Mr. Millar, what policy options do you suggest for fully incorporating public transit into the United States climate change strategy?

Mr. MILLAR. We recommend several things. First, we think it is reasonable to take some of the revenue that would be generated by cap and trade and invest back in public transportation.

We believe that there ought to be national goals set, and each sector ought to have a responsibility for its piece of that, and public transit would have its piece, as to what we could do.

We believe that certain policies—for example, tax policies under the jurisdiction of this Committee—which today favor energy-inefficient public transportation, at least ought to be equalized so that an employer, for example, that wants to encourage his or her employees to use public transit can at least get the same help from the government as if they provide parking to the employees. So, we think there is a series of things there.

We think giving incentives to communities, so that communities and States will invest more in public transit and will have an interest in how they control their land use to get more energy-efficient transit-useful land use, such as Arlington, Virginia chose to do some 25 years ago, and now receives enormous benefit for the decisions made then. Those are examples, sir.

Mr. PASCRELL. Just very briefly, the expansion of the compressed natural gas buses nationwide, what else can we do to promote this technology?

Mr. MILLAR. I think there are several things there, first to realize that already about 25 percent of our bus fleet is alternately powered with clean fuel. That compares with, what, 1, 2, 3 percent of the automobile fleet.

We could certainly provide additional funds and incentives to transit systems to replace their aging fleets more quickly, for example, change the amount of local match that's required. There is a whole series of things that could be done there. All would turn over our fleet much more quickly.

Mr. PASCRELL. All of these are going to necessitate some public investment.

Mr. MILLAR. Yes, sir. I believe so.

Mr. PASCRELL. We have to find the money someplace.

Mr. MILLAR. Yes, sir.

Mr. PASCRELL. Thank you, Mr. Chairman.

Mr. DOGGETT. Thank you. Mr. Davis.

Mr. DAVIS. Mr. Chairman, thank you. I have time for, really, just three observations. The first one, I don't buy the Republican arguments on the science. You could take all the science that the Bush Administration has rejected, and make from it a whole new ecosystem and a whole new globe, and fill it up with new species. So, I am not too enthusiastic about their scientific interpretations.

Point number two, I do think this side of the aisle, which I see as the more progressive side of the American political debate, has to be cautious about one premise. A lot of the arguments that we have made in the context of cap and trade policy sounds something like this. They say, "Well, there will be short-term costs, dispropor-

tionate costs to some parts of the population, but there are significant gains, and those gains will be for the common good."

We certainly don't like that argument on this side of the aisle when it comes to tax policy. You could make a point that President Bush's 2001 and 2003 tax cuts were very good for people whose income rests primarily on dividends and capital gains, but we don't like the thrust of those policies, because it's left us more unequal as a society, and made the Tax Code more regressive.

Most of us on this side of the aisle don't like an unfettered trade policy with no labor and environmental standards, even though some could say unfettered trade benefits certain multi-national corporations, and it's probably for the common good. So, just as we resist those kinds of arguments in the context of trade, as we resist them in the context of tax policy, I think we have to be appropriately dubious in the context of environmental policy.

My third point, I have no doubt that we can fashion short-term, wealth-transferred policies to cushion the impact of cap and trade legislation. I don't doubt that. But this is what I do wonder about.

If we do this in the wrong way, and the consequence of doing it in the wrong way is that communities that are very dependent on heavy duty manufacturing fall even further behind, and the employees of those industries find their skills outmoded for the work that's available, a short-term wealth transfer or reduction on your FICA taxes means nothing if you don't have a job, or if you're not employable.

So, I think we have to be unusually attentive to the fact that the very industries and sectors of the country who are most likely to be displaced are the ones that have already borne the brunt of 10 years of unfettered globalization, and a wide variety of other policies.

Dr. Ackerman, are you trying to jump in?

Mr. ACKERMAN. Yes. Precisely on that point, I certainly think that those communities need to be protected. But I think there is something missing in the whole discussion of competitiveness here. We are talking about it as if cost increases are the only things that affect competitiveness, and a little more cost increase is unbearable for our economy.

Now, you could make a case that the most competitive economies in the world today have some of the highest costs. Germany is often the world's leading exporter in many recent years. Ten percent of all world exports come from Germany, a country with higher wages than we have, higher energy costs, and stricter environmental regulations.

They are doing something there that is making people buy their products that isn't about cutting their costs.

Mr. DAVIS. Here is the only cautionary note I would sound about that. Take coal and steel as two examples.

Mr. ACKERMAN. Yes.

Mr. DAVIS. If you push up the cost of coal and steel production too much, they don't just engage in an economic recalibration of what they do, they sometimes close their plants.

Mr. ACKERMAN. Yes. But Germany and Japan, which has costs similar to ours, labor costs similar to ours, energy costs higher than

ours, they have both made the transition to selling manufactured goods to the world.

People are not buying Toyotas because they're made with low-cost wages. People are not buying German machine goods because they're made with low-cost wages. So, instead of looking over our shoulders at a competition with China to cut wages, which we will never win, we should look over the other shoulder at the competition with Germany and Japan to sell the high-tech manufacturers of the future.

As several people have mentioned, we are in danger of losing solar power, the new energy technology industries, to Germany as well, not to somebody who has lower costs. We're in danger of losing those industries to a country that has higher energy and labor costs than——

Mr. DAVIS. Well, let me just stop you with my final 30 seconds——

Mr. ACKERMAN. Sure.

Mr. DAVIS [continuing]. And say this. As this Committee tries to figure out how to fashion policy that can actually be sold in real time to the voters, ergo our constituents, I think we have to make sure that we are offering them not some long-term gain——

Mr. ACKERMAN. Yes.

Mr. DAVIS [continuing]. Not some intermediate-term gain, but some short-term, immediate-term insulation. Otherwise, they won't be supportive of what we do.

Mr. ACKERMAN. Right.

Mr. DAVIS. We will see a divide between the elites and the people we represent, and that won't be helpful, either.

Mr. ACKERMAN. No, I think we need to figure out some—I don't know how they do it. I think we need to figure out what's the secret of high-cost competitiveness.

Mr. DAVIS. Thank you, Mr. Chairman.

Chairman RANGEL. On behalf of the full Committee, Republicans and Democrats, I want to thank this panel for the high quality of testimony that you have given to us. I am going to accept your testimony merely as appetizers, because the main event comes next year. I do hope that you would be made available, no matter which side—which approach that you're taking, so that we can meet together.

As I was talking with Mr. Doggett, this is a matter that we're going to have to go to the Chief Executive Offices, because it's not an issue for lobbyists to be—we're talking about the country and the world, and so we need those people who have a concern for it.

So, I want to thank you so much for your testimony. We will be in touch, and I'm so sorry for the lateness in the hour, but it certainly was worth it for us to hear your expert testimony.

[Whereupon, at 4:29 p.m., the hearing was adjourned.]

[Submissions for the Record follow:]

Statement of Accor Services USA

Accor Services USA is the leading provider of tax-free commuter benefit solutions in the U.S., and we have made it our mission to make tax-free commuter benefits a staple in employee benefits packages throughout the American workplace to encourage the use of public transportation and therefore contribute to help protect the environment.

Public transportation is one way Americans can reduce their carbon footprint. It is our understanding the primary focus of this hearing, is on legislation which would develop a "cap and trade" program. This type of program certainly has merit, but we urge Congress to also examine ways to reduce emissions from the transportation sector. Mobile source emissions make up roughly ⅓ of all emissions. Global Warming legislation needs to recognize this point and should take steps to promote alternate modes of transportation; including public transportation, and there are actions that this Committee can and should take to this end.

Accor Services USA promotes the use of public transportation to prevent climate change and promote global sustainability through our employer group, third-party administrator and transportation authority programs. Accor facilitates the transit use of over 300,000 people in the U.S. saving them and their employers over $129 million in payroll and commuting costs in addition to over $340 million in gasoline per year and over 8,730,000 pounds of carbon every single day. That adds up to 2,095,200,000 pounds of carbon this year, the equivalent of over 327,000 tons of waste recycled instead of landfill or over 24 million tree seedlings grown for 10 years.

We maintain statistics for our clients nationwide showing the current status as a baseline and also showing the improvements and impacts of new legislation. These statistics are impressive, but there is room for growth within our employer base. We urge Congress to include the following provisions in a Climate Change package in order to ensure that more Americans utilize public transportation as a way to reduce their carbon footprint.

- Establish a Pilot Program Where Companies Can Earn Credit for the Amount of Carbon They Conserve Through Employee Transit Benefit Programs

Accor urges Congress to provide an incentive for private sector companies to subsidize their employees' transit trips through the transportation fringe benefit. This incentive can come in the form of credits that can be applied to other aspects of the company's business activities or can be sold to companies who exceed their targeted carbon emissions. By including such a provision Congress will be providing the private sector with an incentive to initiate transit benefit programs, which will ultimately result in less congestion in U.S. cities, better air quality, and a reduction in mobile emissions.

Accor works with its clients to track and monitor how many pounds of carbon are being conserved using precise modeling and tracking software. Recently, we were approached by a client company with over 130,000 U.S. employees who were commuting to work every day. This company already has a commuter benefits program in place, and through that program over 2,300 employees utilized public transportation. By utilizing EPA and U.S. Census Bureau statistics around average commutes we were able to help this employer quantify the savings that those employees represented in terms of emissions and saved gasoline. Through its commuters, this company was saving the equivalent of:

- Over 3,000 gallons of gasoline each day.
- Over 828,000 gallons of gas each year.
- Over 66,000 pounds of carbon each day.
- Over 16 million pounds of carbon each year
- 16 million pounds of carbon is the equivalent of saving:
  - Carbon emissions from over 16,900 barrels of oil being consumed.
  - Carbon emissions from the electricity use of over 900 homes for a year.
  - Carbon sequestered by 186,824 tree seedlings grown for 10 years.
  - Carbon sequestered annually by 50.8 acres of forest prevented from deforestation.

Based on the results of our calculations, this company has now decided to move forward with an aggressive program to increase employee participation in its commuter benefit, so that employees are better able to access the tax savings in this time of rising fuel costs; and so that the company may better support its environmental initiatives.

With this technology, we are able to monitor and track exactly how much carbon is being reduced. This information can be verified by EPA and other entities so that the accuracy of data satisfies the need for accurate and dependable substantiation. We are confident that if a cap and trade program were to include a provision that would help them earn credit for their employee trip reduction, more companies would get engaged.

- Establish Parity Between the Parking and Transit Portions of the Transportation Fringe Benefit

Section 132(f) of the Internal Revenue Code provides employees and employers with a transportation fringe benefit. Currently the monthly cap for the benefit is $220/month for parking and $115/month for transit. The disparity between the two benefit levels creates a financial incentive for Americans to drive to work. Many times, those Americans with transit commutes which cost over $115/month are those who travel the furthest distance and emit the most carbon. Accor urges Congress to establish parity between parking and transit. Congressman McGovern (D–MA), has introduced legislation to this effect, (H.R. 1475), additionally, we understand that one legislative proposal calls for parity to be established at $200/month, creating a revenue positive proposal. Accor urges Congress to include this proposal in the Global Warming legislation, or at its earliest convenience.

- Set-Aside Proceeds From "Cap and Trade" for Transit

With one-third of all carbon emissions stemming from the transportation sector, it would be prudent for Congress to set-aside a portion of the proceeds generated from a cap and trade program for the expansion of mass transportation. Additionally, a portion of these funds should be dedicated to the marketing and promotion of mass transportation. The capital needs of transit systems are overwhelming, and should be addressed, but we would urge Congress to recognize that these funds should not only go toward expanding transit into areas that are not currently served by mass transit, but funds should also be spent to better market and provide outreach where transit is already available.

Accor is grateful for the opportunity to submit written testimony and looks forward to working with this Committee as the process moves forward.

Statement of Environmental Defense Fund

I am pleased to submit the attached statement from Environmental Defense Fund to be entered into the record for the September 18 hearing on climate change. We encourage the Ways and Means Committee to continue to delve into this critically important issue and urge you to make a cap on greenhouse gas emissions a high priority for 2009.

There is no time for delay. The U.S. needs to move quickly and aggressively to spur economic and job growth, increase our energy independence, and stabilize our climate. A strong emissions cap with aggressive near- and long-term reduction targets would provide investors, innovators, and businesses with the reliable, long-term demand for low-carbon solutions they'll need to make that transformation a reality. Two climate bills that have been referred to your Committee—the Climate MATTERs Act (H.R. 6316) and Investing in Climate Action and Protection Act (H.R. 6186)—reflect the needed level of reductions.

Importantly, the U.S. can achieve these reductions while maintaining robust economic growth in the U.S. As the attached statement details, several independent studies conducted by highly respected groups in government and academia share a key finding: That the overall impact of climate policy on the U.S. economy will be small.

We thank you for holding the hearing and look forward to working with you to develop an environmentally and economically sound solution early in the 111th Congress.

Sincerely,

Nathaniel Keohane
Director of Economic Policy and Analysis
Environmental Defense Fund

What Will it Cost to Protect Ourselves From Global Warming? The Impacts On the U.S. Economy of a Cap and Trade Policy for Greenhouse Gas Emissions

Nathaniel Keohane, Ph.D.

Peter Goldmark

Executive Summary

Important parts of the world are acting to reduce the greenhouse gases that cause global warming, and the United States is now debating whether to join that process. This paper examines the potential impact of a cap on greenhouse gases on the U.S. economy as a whole and on American families.

What will it cost to protect ourselves against the potentially catastrophic consequences of global warming? Advocates of action anticipate minimal costs. Those who want to do nothing sometimes assert that carbon cuts will "bankrupt the economy." Who is right?

This paper conducts the broadest assessment to date of the impacts on the U.S. economy of capping greenhouse gases. This report synthesizes the findings of several state-of-the-art economic models, and arrives at a strong conclusion:

The United States can enjoy robust economic growth over the next several decades while making ambitious reductions in greenhouse gas emissions. If we put a cap and trade policy in place soon, we can achieve substantial cuts in greenhouse gas emissions without significant adverse consequences to the economy. And in the long run, the coming low-carbon economy can provide the foundation for sustained American economic growth and prosperity.

But for such a policy to be truly affordable, we must act now. Delay will greatly increase the economic cost of making the necessary emissions reductions, and will risk locking in irreversible climate change. And delay will put the United States further behind the rest of the world in the race to invent and produce the next generation of energy technologies.

What Makes Our Analysis Different—Relying On a Range of Forecasts

We surveyed eight policy scenarios analyzed by five highly respected, transparent, and peer-reviewed economic modeling groups in government and academia: The Energy Information Agency (EIA), Research Triangle Institute (RTI), Harvard (the IGEM model), the Massachusetts Institute of Technology (MIT), and Pacific Northwest National Laboratories (PNNL). None of these models is perfect, as no economic model can be. A particular challenge for models is predicting the course and pace of technological innovation—a key economic driver in the transition to a low-carbon economy.

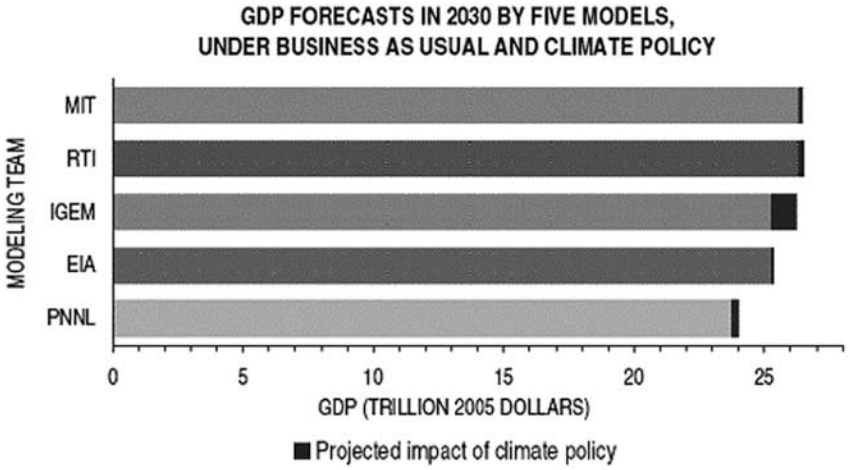
Advocates have cherry-picked the largest or smallest numbers from one or another of these models to support their positions. But sweeping conclusions based on a single model cannot be trusted. Judiciously using a range of current models, however, can inform the policy debate in useful ways.

Ambitious Climate Policy Is Affordable

While these models take different approaches to representing the U.S. economy, they share one basic conclusion: The overall impact of climate policy on the U.S. economy will be small.

- The U.S. economy has averaged nearly 3% growth per year in the postwar period, and is projected to continue at nearly that pace. The projected median impact on that annual growth of capping greenhouse gases is three-hundredths of a percentage point (0.03%).
- The U.S. economy is projected to nearly double in size between now and the year 2030. In that year, the median forecasted cost to the U.S. economy of capping greenhouse gas emissions is only 0.58%.

- The projected impact on GDP can be thought of this way: Under business as usual, the total output of the U.S. economy is projected to reach $26 trillion in January 2030. With a cap on greenhouse gases, the economy will get there by April.
- In present-value terms, the median projected impact of climate policy on U.S. GDP is less than one-half of 1 percent for the period 2010–2030, and under three-quarters of 1 percent through the middle of the century.
- The range of differences among models about the future size of the economy overwhelms the impact that any of them projects from a cap on carbon; in other words, even under varying assumptions, the impact of climate policy is small. The models vary by as much as 10% in their estimates of what economic output will be in 2030—17 times the estimated 0.58% cost of capping greenhouse gases.



Importantly, none of these models takes into account the damages from allowing global warming to build up unchecked and the value of avoiding them. That is, they look at only one side of the ledger: the costs of acting, not the benefits. These "costs" of reducing emissions actually represent an investment that will pay enormous dividends—by creating a low-carbon economy filled with new opportunity, and by ensuring a livable planet for generations to come.

A Cap On Greenhouse Gases Will Not Adversely Affect Employment In the American Economy

- The overall impact of climate policy on employment, according to government projections, will be very small—a cumulative reduction of less than one-twentieth of 1 percent (0.05%) over the next two decades, relative to business as usual. That forecast, moreover, considers only current sectors of the economy; by its nature, economic modeling cannot anticipate the emergence of entirely new sectors—and the associated jobs—that will arise in the low-carbon economy.
- The manufacturing sector has a high level of job turnover—over 10% of all manufacturing jobs are either created or destroyed every 3 months. By comparison, the impact of capping greenhouse gases on manufacturing employment will be tiny—a cumulative effect of only a few percentage points over more than two decades. And this is the sector expected to be affected most by a cap on greenhouse gases.

The number of manufacturing jobs created or destroyed every three months is much greater than the cumulative projected impact of climate policy over 20 years.

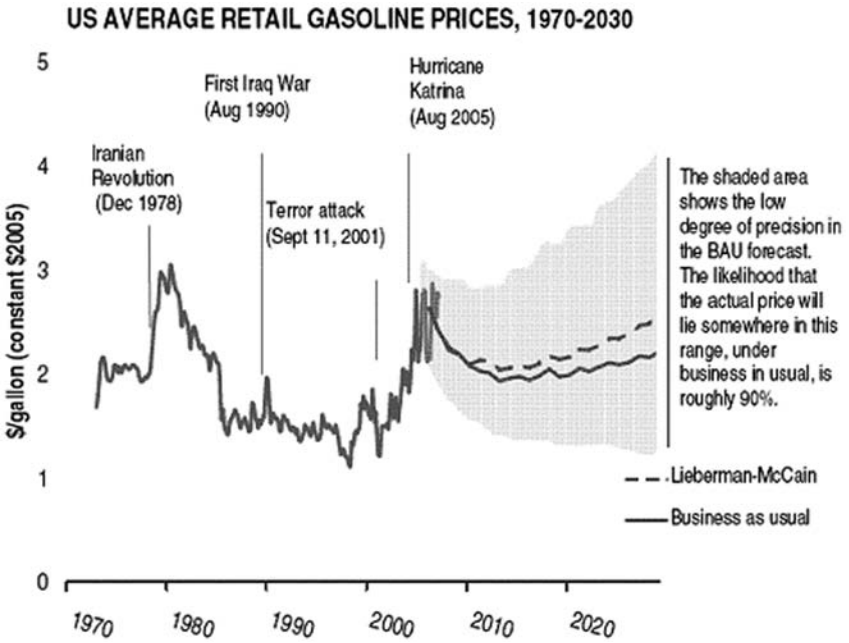
- Of course, no one whose job is lost is comforted by the fact that he or she is one of relatively few affected. The broader trend of job erosion in the manufacturing sector can neither be reversed nor eased significantly by climate policy—precisely because the effects of such policy are so small. Dealing with volatility in this sector will remain the province of other aspects of American economic and social policy.

  For the average American family, the cost of capping greenhouse gases will amount to less than 1% of household budgets over the next two decades.
- Stated as a fraction of household income, capping greenhouse gases will cost families less than a penny on the dollar. This is much less than what Americans already spend in their household budgets to protect themselves and their families. By comparison, more than 3 cents of every dollar already goes to insurance; nearly 4 cents goes to national defense; and 10 cents goes to Social Security.

The Effects of Capping Greenhouse Gases On Household Energy Bills Will Be Modest, and Are Much Smaller Than the Fluctuations That American Families Already Live With

Household impacts will be most pronounced in the area of energy prices because of our dependence on fossil fuels. Importantly, energy prices are accounted for in the overall impacts described above. But even taken in isolation, the projected effects of climate policy on household energy spending are modest.

- Home energy bills are projected to rise by only a few dollars a month over the next two decades, relative to business as usual, taking into account effects on prices and corresponding shifts in household consumption. And the fact that the overall costs of capping greenhouse gases will be so modest means that we can easily afford programs to offset the burden of these increased costs on low-income households.
- Price fluctuations due to supply bottlenecks and Mideast politics are recurring consequences of relying heavily on imported hydrocarbon fuels. Recent run-ups in the price of gasoline at the pump and in the price of home heating oil and natural gas are several times larger than the predicted effects of capping greenhouse gases.
- By the same token, the uncertainty about what gasoline prices (or other energy prices) will be two decades from now dwarfs the estimated impact from climate policy. For example, one study projects that a cap on greenhouse gases would add about 15% (35 cents a gallon) to the price of gasoline in 2030 relative to business as usual. This is much smaller than the uncertainty surrounding any estimate of gasoline prices that far in the future. This conclusion is in line with other assessments: The median forecast for the studies discussed here is an increase of 13% by the year 2030.



If We Act Now, a Cap and Trade Policy Can Provide the Basis for Continued U.S. Economic Leadership

In the longer term, the transition to a low-carbon economy may offer the United States a comparative advantage in a highly competitive world. A look back at the history of the U.S. economy since World War II teaches a number of lessons:

- American ingenuity and innovation have achieved challenges of much greater magnitude before. The mobilization for World War II involved a complete transformation of the U.S. economy in just 2 years. If we do not waste our scarcest resource—time—we can make the transition to a low-carbon economy without adverse macroeconomic impacts.
- Technological change is the engine of progress in the American economy. We emerged as the world's economic superpower in the last century by leading every economic revolution—from mass production to aviation to semiconductors and the Internet. Our continued prosperity in the new millennium depends on leading the next transformation: The emergence of a low-carbon economy.
- But innovation does not just happen: It responds to the basic economic drivers of demand and price. A hard, long-term cap on carbon emissions will provide the market signals necessary to spark innovation and unleash the kinds of powerful market forces that propelled our economy in the postwar period. A failure to stimulate innovation through a carbon cap will cede leadership in the low-carbon economy to others.

Environmental Defense Fund is dedicated to protecting the environmental rights of all people, including the right to clean air, clean water, healthy food and flourishing ecosystems. Guided by science, we work to create practical solutions that win lasting political, economic and social support because they are nonpartisan, cost-effective, and fair.

This report is available at www.edf.org/climatecosts.

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Statement of Humane Society of the United States and the Humane Society International

The Humane Society of the United States (HSUS), the Nation's largest animal protection organization representing 10.5 million supporters, and Humane Society International (HSI), the international arm of HSUS, submit the following comments to the House of Representatives Committee on Ways and Means.

HSUS and HSI are encouraged that the Committee on Ways and Means recognizes the need for policy mitigation strategies that will reduce and stabilize greenhouse gas (GHG) emissions from industry, agriculture, and transportation in the United States. However, we are troubled by many of the existing proposals—including H.R. 2069 (The Save Our Climate Act of 2007), H.R. 6316 (The Climate MATTERS Act of 2008), H.R. 3416 (America's Energy Security Trust Fund Act of 2007), and H.R. 6186 (The Investing in Climate Action and Protection Act of 2008)—as very few, if any, take into account farm animal production, despite its contribution to GHGs.

The United Nations Food and Agriculture Organization (FAO) has found that the farm animal sector contributes 18% of total GHGs, which is more than the entire transportation sector, including cars, trucks, airplanes, and ships.[1] Every step of meat, egg, and milk production—including the land use changes for feed crop production and grazing land, the manufacture of fertilizers and pesticides for feed crops, the transportation of live animals and animal products, and the management of farm animal manure—contributes to GHG emissions. Fertilizer production for soy and corn crops for farm animal feed alone contributes some 41 million tonnes of carbon dioxide annually.[2]

Conversely, more sustainable and higher welfare animal production practices, including pasture-raised systems, can help mitigate the effects of climate change by helping to sequester carbon in the soil, reducing deforestation for soy and other feed crop production, and eliminating the need for artificial sources of fertilizer.

Furthermore, the manufacture of biofuels from both animal waste and animal fat has the potential to encourage unsustainable animal agriculture practices. On farms raising both plants and animals, manure is typically a very efficient and available source of nutrients for crops, often eliminating the need for any artificial fertilizers. On factory farms, however, the huge quantity of waste produced makes it nearly impossible for the manure to be utilized as fertilizer on nearby cropland, a problem made worse by beef, chicken, egg, and dairy operations increasingly being sited far from where crops are grown. Storage of manure in lagoons can also contribute to water pollution and harmful air emissions, according to a Government Accountability Office (GAO) report released in September 2008.[3]

As a result, Smithfield, Tyson Foods, and many other animal agribusinesses are looking for ways to profit from the 500 million tons of manure generated annually by industrial farm animal production operations.[4] The cost of installing digesters and biogas recovery equipment can be extremely expensive, and many of these systems are supported by government subsidies and tend to only be profitable at large-scale industrial facilities.[5]

Installing anaerobic digesters can require significant investment depending on the type of system used. As a result, some States have grant and subsidy programs that offset the cost of installation. However, digesters work best on large factory farms that have "stable, year-round manure production," not smaller scale farms that lack the necessary infrastructure to collect at least half of that manure every day.[6]

Additionally, the funding of anaerobic digesters through the EPA AgStar program for industrialized animal production operations in the United States and the use of the Clean Development Mechanism (CDM) of the Kyoto Protocol to fund installation of anaerobic digesters in developing countries may actually encourage the growth

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[1] Steinfeld H, Gerber P, Wassenaar T, Castel V, Rosales M, and de Haan C. 2006. Livestock's long shadow: Environmental issues and options. Food and Agriculture Organization of the United Nations, p. xxi.

[2] Ibid, p. 86.

[3] U.S. Government Accountability Office (GAO). 2008. Concentrated animal feeding operations. EPA needs more information and a clearly defined strategy to protect air and water quality from pollutants of concern. September 2008. GAO–008–944.

[4] U.S. Environmental Protection Agency. 2003. National Pollutant Discharge Elimination System permit regulation and effluent limitation guidelines and standards for concentrated animal feeding operations (CAFOs); final rule. February 12. Federal Register 68(29):7176, 7180.

[5] U.S. Environmental Protection Agency. 2007. EPA helps farmers turn livestock waste into wealth. January 18. http://yosemite.epa.gov/opa/admpress.nsf/756fc9115d0af011852572a00065593e/c9f1eb2189c4600d852572670065a77d!OpenDocument. Accessed April 23, 2008.

[6] U.S. Environmental Protection Agency. Managing manure with biogas recovery systems, improved performance at competitive costs. The Agstar Program, p. 5.

of factory farms internationally, which will further exacerbate environmental challenges and animal welfare assaults.

There is also concern that the use of market-based carbon offsets or carbon trading mechanisms could do more harm than good. Many environmental organizations are wary of supporting projects in the developing world, such as planting trees to offset the carbon emissions from air travel and other activities. Unless there are strict regulations and compliance mechanisms in place, such programs could support fast-growing tree plantations for the timber industry, for example, that do very little to sequester carbon or mitigate climate change. A better approach is to steer carbon trading toward projects that actually keep wild forests intact and support conservation of species, including gorillas and other endangered animals indigenous to forest ecosystems, such as those supported by the United Nations Environment Programme Great Ape Survival Project (GRASP).[7]

In addition, ethanol production may actually contribute more GHGs than fossil fuel-based energy.[8] The ethanol industry is also selling ethanol co-products, including distiller's grains (DGs), a waste or co-product of dry mill ethanol production, in an attempt to create a symbiotic relationship between industrial animal agriculture and the biofuel industry.[9, 10]

Recycling ethanol co-products, however, is not always healthy for animals or humans. Research from the University of Kansas in 2007 suggests that cattle who are fed DGs have a higher likelihood of harboring *E. coli* O157 in their hindgut, or colon.[11] While the pathogen doesn't harm cattle, it remains the leading cause of kidney failure among previously healthy children and kills dozens of Americans a year.[12]

Given the importance of animal agriculture both in contributing to and mitigating climate change, it is crucial that any climate change policy or laws enacted by the United States take farm animal production practices into account. While there may be concern regarding the expense of encouraging farmers to transition away from industrial, low-welfare[13] animal agriculture practices, including rearing animals in fossil fuel-intensive confined animal feeding operations (CAFOs), the long-term social, environmental, economic, and public health benefits of more sustainable, higher-welfare systems outweigh any short-term financial input.[14] As well, public opinion polls consistently show that U.S. consumers are concerned not only about food safety and environmental integrity, but also the welfare of animals raised for meat, eggs, and milk, and have expressed a willingness to pay premium prices for higher welfare and organic products.[15, 16]

Communities also benefit from less ground and surface water pollution when factory farms are not located nearby.[17] Public health is also jeopardized—asthma, diarrhea, headaches, and sore throats are all more common among neighbors who live

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[7] United Nations Environment Programme (UNEP). Great Ape Survival Project (GRASP) http://www.unep.org/GRASP/. Accessed September 2008.

[8] Searchinger T, Heimlich R, Houghton R, Dong F, Elobeid A, Fabiosa J, Tokgoz S, Hayes D, and Yu T. 2008. Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land Use Change. Science, 319. 5867: 1238–40.

[9] Biofuels can help the livestock sector. 2008. Farmers Guardian. March 13, 2008. http://www.farmersguardian.com/story.asp?sectioncode=1&storycode=17019. Accessed March 20, 2008.

[10] Lardy G. 2008. Biodiesel benefits for cattle producers: Feeding byproducts of biodiesel production. Executive Summary. p. 1.

[11] M.E. Jacob, J.T. Fox, J.S. Drouillard, D.G. Renter, T.G. Nagaraja. 2008. Effects of dried distillers' grain on fecal prevalence and growth of Escherichia coli O157 in batch culture fermentations from cattle. Applied and Environmental Microbiology, 74. 1:38–43.

[12] National Institutes of Health. 2005. Foodborne diseases. National Institute of Allergy and Infectious Disease fact sheet. February. www3.niaid.nih.gov/healthscience/healthtopics/ecoli/Complications.htm. Accessed September 26, 2008.

[13] See The Humane Society of the United States. An HSUS Report: the welfare of intensively confined animals in battery cages, gestation crates, and veal crates. http://www.hsus.org/webfiles/PDF/farm/hsus-the-welfare-of-intensively-confined-animals.pdf.

[14] National Commission on Industrial Farm Animal Production. 2008. Putting meat on the table: Industrial farm animal production in America. A report of the Pew Commission on industrial farm animal production. Executive summary, p. 51–5. http://www.ncifap.org/__images/PCIFAPSmry.pdf. Accessed September 24, 2008.

[15] Technomic survey. 2007. Cited in MeatingPlace. Q and A Animal kingdom. May 2007. p. 23.

[16] Harris Interactive. 2007. Large majorities see organic food as safer, better for the environment and healthier—but also more expensive. Harris Poll #97, October 8, 2007. http://www.harrisinteractive.com/harris__poll/index.asp?PID=813.

[17] U.S. Environmental Protection Agency. 2003. National Pollutant Discharge Elimination System permit regulation and effluent limitation guidelines and standards for concentrated animal feeding operations (CAFOs); final rule. February 12. Federal Register 68(29):7176, 7237.

close to factory farms.[18] As a result, the American Public Health Association has recommended a moratorium on construction of new CAFOs.[19] Furthermore, the prestigious Pew Commission on Industrial Farm Animal Production has recommended, in addition to phasing out intensive animal confinement practices such as battery cages, sow gestation crates, and veal crates, phasing out the use of antibiotics in animal agriculture because of concern about antibiotic resistance.[20]

In consideration of the competition concerns raised, HSUS and HSI strongly believe that the United States must participate in an international agreement, where all major emitting countries commit to following the same rules. This lessens the potential for the United States to have higher costs or for U.S. products to be uncompetitive with products from another country, as all signatories to the agreement will be obliged to follow a similar climate change mitigation scheme.

Statement of Industrial Energy Consumers of America

The Industrial Energy Consumers of America (IECA) is a trade association whose membership are exclusively large energy intensive consuming companies with representation from every sector, has firmly concluded that because they compete globally on both exports and imports; and if the U.S. regulates ghg emissions using a cap and trade policy approach, it will be critically important that energy intensive consuming industries be provided free emission allowances to cover the resulting increase in both direct and indirect costs. If not, their competitiveness will be at risk and will unfortunately result in their movement to countries that have lower energy and compliance costs. It is a matter of economic survival.

There are several policy options beside cap and trade to regulate ghg emissions that vary greatly in effectiveness and cost. Regardless of the choice, it is essential that the 'border adjustment' issue avoid throwing the energy intensive manufacturing companies into a legal morass with the WTO. This is not only expensive and time consuming but adds tremendous uncertainties that will negatively impact companies and entire industrial sectors.

Climate change and the policies necessary to avoid and reduce greenhouse gas emissions is a top priority for IECA. We welcome the opportunity to work with you and the Committee to fashion a regulatory system that is cost effective in reducing ghg emissions. We know something about reducing ghg emissions. The industrial sector's ghg emissions are at 1990 levels while the residential, commercial, transportation and power sectors emission have all increased by over 30 percent.

The Industrial Energy Consumers of America is an association of leading manufacturing companies with $500 billion in annual sales and with more than 850,000 employees nationwide. It is an organization created to promote the interests of manufacturing companies for which the availability, use and cost of energy, power or feedstock play a significant role in their ability to compete in domestic and world markets. IECA membership represents a diverse set of industries including: plastics, cement, paper, food processing, brick, chemicals, fertilizer, insulation, steel, glass, industrial gases, pharmaceutical, aluminum and brewing.

Statement of James Culliton

Thank you for the opportunity to provide a statement regarding the issue before you. My name is James Culliton; I am affiliated with no group and have no financial interest in the matter at hand.

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[18] U.S. Environmental Protection Agency, Office of Water. 2001. Environmental assessment of proposed revisions to the National Pollutant Discharge Elimination System regulation and the effluent guidelines for concentrated animal feeding operations. www.epa.gov/waterscience/guide/cafo/pdf/EnvAssessPt1of2.pdf. Accessed September 24, 2008.

[19] American Public Health Association. 2003. Precautionary moratorium on new concentrated animal feeding operations (CAFOs). September 24, 2008. http://www.apha.org/advocacy/policy/policysearch/default.htm?id=1243. Accessed September 24, 2008.

[20] National Commission on Industrial Farm Animal Production. 2008. Putting meat on the table: Industrial farm animal production in America. A report of the Pew Commission on industrial farm animal production. Executive summary, p. 21–22. http://www.ncifap.org/__images/PCIFAPSmry.pdf. Accessed September 24, 2008.

Having read the written testimony as submitted on September 18, 2008, it is apparent that my comments lack the pedigree and meticulous investment in research and citations evidenced by most of that testimony. Yet, I believe my comments are salient to the issue.

If some variant of cap and trade is passed, I have several concerns.

First, how would Federal carbon permits be integrated into existing State, regional and post-2012 carbon trading schemes? Arbitrage is not a mere possibility, it is a certainty, unless structurally mitigated through thoughtful design. If the overuse of derivatives has rendered it difficult to valuate a company, imagine how emissions trading of pollution credits in multiple markets will render actual reduction difficult to gauge.

Second, in the retail electricity context, should utility shareholders or ratepayers benefit from emissions reductions? These reductions will trace back to effective demand-side management, increasing use of renewable generation, as well as pollution control device installation. If there is profit realized from the sale of emissions credits, it should be distributed to the ratepayers, who would have reduced their consumption and paid for the construction/operation of renewable generation and pollution control devices. The utility shareholders are already able to earn a return of their capital investment plus a return on the latter two; they should not realize a double return in the form of any emissions credit trading profits.

Third, although a 100% auction with a floor and a ceiling should be used, if allocation is the chosen means to distribute credits (or a hybrid auction-allocation as in the current Boxer bill), allocations should not be given away. The regressive impact of this granting of a property right would be disastrous. Kyoto punted on the initial valuation question: The price to pollute was set at zero. In broad terms, an emission credit allocation masks the true cost of a particular enterprise. If the true costs of doing business are not reflected in an enterprise's end-product, the market is shielded from price signals that might otherwise operate to reward an enterprise that pollutes less. In other words, allocating credits prevents a market from rewarding efficient production. If there is no reward for reducing emissions, there is little chance an enterprise would put itself at a competitive disadvantage. Assuming pollution efficiencies are otherwise desired (perhaps to boost a marketing campaign), the price of each credit would fall proportionately, even in a trading market where the supply of credits is limited. The SO_2 system anticipated this and devalued future credits incrementally; apparently, Kyoto did not. This general point is compounded when, as in Kyoto, the initial allocation of credits exceeds the absolute number of credits needed. Certainly, the collapse of many former Soviet-bloc industries is partially to blame, as it created a glut of credits. Our national push—evidenced in Renewable Portfolio Standards at the State level—toward renewable generation and increased demand-side management could create a similar glut. The banking of credits (particularly when their carried-over value is undepreciated) and imprecise initial calculation of actual numbers to allocate is even more troubling on a going-forward basis.

Respectfully, I believe the best available option would be an upstream carbon tax, distributed across sectors evenly, with the proceeds to be distributed on a pro-rata basis to taxpayers (after monitoring/enforcement monies are removed). To combat any resulting import and export competitive disadvantages, an import tax or export credit could be handled at the Customs office in question. If this structure creates a problem with international trade group compliance, fix the trade group rules to recognize a carbon exception. The issue is really not insurmountable. The only real problem with a tax structure is that it reduces the emitters ability to choose when to reduce emissions. The other side of the when coin is that it fosters innovation and technological advance more quickly—thereby addressing the underlying problem of excess carbon dioxide in the atmosphere faster. A tax also has the advantage that it could be ratcheted up or down on a yearly basis to address any unintended effects. A cap and trade does not have such flexibility, especially if banking is permitted. Finally, assuming the U.S. participates in the next phase of a global cap and trade, if a tax is established, the emitters who reduce would be well-positioned to capitalize in the global emissions market. Since the baseline for emissions would be set at pre-2008 levels, the U.S. emitter who reduces would in essence receive a double reward for designing and implementing efficiencies: Through lowering its domestic tax liability (thereby either raising net profits or gaining competitive market-share advantages) *and* gaining more credits faster on the global emissions market.

Statement of Julian Keniry

Thank you, Chairman Rangel and Ranking Member McCrery, for hosting this important hearing on policy options to address climate change. Since 1936, the National Wildlife Federation has advocated for wildlife habitat and protection, environmental education, and conservation of our public lands. The Federation has over 4 million members and supporters and 48 affiliate organizations across the country. We have a robust climate change policy solutions campaign, and I am here today to talk with you about one important aspect of our multi-faceted program, climate change education. I direct the Federation's Campus Ecology Program, which supports student and faculty efforts to help reduce the carbon footprint on college campuses and to promote sustainability curricula at universities.

We commend you for holding this important hearing and for considering legislation to support strong reductions in greenhouse gas emissions to put America on the path to a clean energy future. We can work together to create a new energy economy that protects wildlife, creates new green jobs, provides strong green education programs, and ensures a thriving economy. As you consider policy options to curb climate change, we urge you to support policies that will help wildlife adapt to global warming and support comprehensive global warming education to prepare citizens for the opportunities of the new energy economy. We strongly believe that auction proceeds from a cap and trade climate security act should remain dedicated to climate change solutions.

We also recognize the efforts of Congressmen Markey and Honda who have introduced legislation to advance climate change education. While the language included in Congressman Doggett's H.R. 6316 is a step in the right direction, we must do more and we must act quickly to ensure the public moves beyond mere awareness of global warming as a problem to a strong understanding of the causes of global warming and what they can do to find solutions.

The Federation's research shows that a dramatic investment in climate change education is needed to ensure sufficient emissions reductions to stop global warming and to prepare the next generation for our new clean energy economy. The recent spotlight has focused on how our new economy will create millions of "green"-collar jobs, but much less attention has been paid to what is needed to prepare our Nation's young people for these rewarding new careers. In August 2008, we released, Campus Environment 2008: A National Report Card on Sustainablity in Higher Education. This report contains some surprises. It shows that many positive changes are occurring on U.S. campuses, especially in the greening of campus operations. There are no surprises there. But unexpectedly, the amount of sustainability-related education offered on campuses did not increase since our 2001 study and may have even declined. In short, the curriculum is not keeping pace with the greening of campus operations and faculty are lagging behind their staff and administrator peers in fostering sustainability education. This is cause for deep concern.

The National Wildlife Federation's report reflects the Nation's largest survey created to gauge campus leadership for sustainability—with more than 1,060 participating schools—and demonstrates how our learning hubs integrate green programs into day-to-day operations such as transportation, landscaping, energy conservation, and waste reduction. But schools fall behind when it comes to providing students with the academic preparation needed to face environmental challenges and seize the opportunities of the future. Our results show that, in the past 8 years, sustainability-related education offerings and recruitment programs have declined, as have faculty conducting environmental and sustainability research.

Our 2001 to 2008 comparison of the curricular and academic dimensions of sustainability shows little infusion of sustainability concepts across disciplines, very few campuses requiring sustainability courses for all students, and low levels of support for faculty development on climate change and other sustainability topics. Students studying subjects such as engineering, business, health sciences and teacher education—disciplines crucial to our Nation's ability to create a sustainable economy—receive relatively little exposure to sustainability concepts and courses. Just over half of colleges and universities now either offer an undergraduate minor or major in environmental and sustainability studies, down from two-thirds in 2001. In 7 years, no significant gains in educating students on sustainability have been made despite the growing depth of the global warming challenge and what it means to future professions and their related disciplines.

Yet, America and the world are in the midst of revolutionary change. In just the past few years, the threat of global warming has shifted in the United States from a distant worry to a present and intense national public conversation. Business leaders and policymakers are responding with new proposals every day amidst shifting markets. These shifts are challenging the American education system, especially

higher education, to keep pace and ultimately lead in the realm of environment and sustainability.

Two things are certain. First and foremost, we have never before had an environmental challenge on such an immense scale as to force modern society to remake itself. America will require a new energy economy and needs an educated workforce to get started on that right away. Second, addressing this problem and shaping a more sustainable, low-carbon society will require new thinking supported by new technology, design, businesses, financing, consumer behaviors and career paths. That is where education comes in. It plays important roles by both being part of a changing world and also actively shaping the future direction of that world.

American higher education has risen to past challenges—and has the people and the resources already in place to meet today's challenges head-on. It produces 30 percent of the world's scientists and a remarkably large percentage of the world's business, diplomatic and government leaders. Higher education leaders have always been clear that successful development of human talent and globally-competitive skills provide the United States with the many critical opportunities and advantages.

The men and women, who in 20 or fewer years, will lead our businesses, educational institutions and government agencies are in school now. We need to offer them the kind of academic and professional preparation that will ready them to envision and create a different kind of world. It will be a world which has new and cleaner forms of energy production, transportation, agriculture, natural resource management, health care, scientific research, micro and macro businesses, and other essential technological advances. To achieve this at the speed required will call for serious new support including a reevaluation of how we educate every degree candidate from architecture and engineering to accounting and even teaching itself.

Elevating education for sustainability will require new levels of incentives for higher education and, in particular, support for faculty. College and universities need to have the means to provide faculty with time to network with other faculty and to redesign their course work. They also need the proper incentives to establish and track objectives for sustainability education across all disciplines and to foster interdisciplinary research and teamwork among faculty, students and staff within and among campuses and with their larger communities. With the passage of the Higher Education Sustainability Act provisions in August 2008, which was championed by Congressman Blumenauer, we have taken a step in the right direction on sustainability education. We must, however, act quickly to appropriate significant funding to support climate change education at all levels.

We need to prepare students entering college as well. In addition to higher education, we need to support comprehensive global warming education in our elementary and secondary academic development, vocational and school-to-work programs, professional training and re-training, and broad consumer education.

As a Nation, the United States has a rich tradition of excellence in education, especially higher education. But we are witnessing national and global changes that pose new challenges and opportunities for higher education leadership. This Report Card tells us there is a widening gap between where American higher education actually is on teaching and learning for sustainability and where it should be. Our national assessment findings serve as a warning. If we are unable to bridge the gap in student education for sustainability, we miss vast needs and opportunities. Our findings also point to the need to incorporate global warming education throughout our public education programs from elementary and secondary schools, to vocational schools, to professional training, and general consumer education. With a greater focus on making the transition and given adequate human and financial resources, we can bring our public education systems to speed and help shape a brighter and more sustainable future.

We therefore urge the Committee to include strong allocations for a comprehensive global warming education policy platform in its climate security legislation. We applaud your work in holding this important hearing. Thank you for your time and consideration.

Dear Chairman Rangel and Members of the Committee,

I'm writing in support of Congressman Doggett's Climate MATTERS Act and to urge the Committee to pass this legislation and give it an opportunity for debate by the full House. While several worthy bills have been filed in the House and Senate addressing the critical and immediate challenge of climate change, H.R. 6316 contains certain elements that are unique and which merit careful consideration. In

this respect, I would like to highlight the following elements of the Climate MATTERS Act:

• *Allocation and Distribution of Emission Allowances*—Of the several greenhouse gas (GHG) cap and trade bills filed in the House and Senate, the approach to allowance allocation/distribution taken in H.R. 6316 does the best job of allowing unfettered market forces to drive GHG emission reductions. The success of any cap and trade GHG regime depends primarily on providing clear and undistorted price signals to the marketplace, internalizing the true costs of GHG emissions and providing economic incentive for investment in clean energy alternatives. In contrast to other legislative approaches that would hand out the bulk of GHG emission allowances under a free allocation system and take decades to transition to an auctioning system, H.R. 6316 begins in 2012 with 85% of allowances being distributed through auctions and phases to full auctioning in a relatively short 5 years. Clearly, this is the approach that puts the fullest faith in free market forces, the greatest trust in the innovative capacity of American business and the highest level of confidence in the wisdom of the consumer. Likewise, auctioning helps eliminate the manipulation and jockeying for windfall profits that we have already seen regulated entities engage in as free allocation systems have been developed and proposed.

• *Cost Relief Measures*—H.R. 6316 recognizes the potential for unacceptable short-term risk to the U.S. economy that could be realized if the price for emission allowances rises too high too quickly. To this end, Sec. 9933 allows for cost relief measures that still maintain the integrity of the overall program. Certain other legislative approaches merely cap the price of emission allowances or allow for the unrestricted release of additional allowances when trading prices reach a certain point. This, of course, distorts price signals, undermines the market forces upon which a cap and trade regime depends, reduces the corresponding incentive for investment in clean energy alternatives and threatens our ability to achieve the intended reductions in GHG emissions. H.R. 6316 instead allows for an increase to limits on foreign allowances and offset credits—thus ensuring that a temporary dampening of price signals is accompanied by a theoretically equal reduction or sequestration of GHG emissions.

• *Global Cooperation*—H.R. 6316 creatively and even-handedly resolves ongoing concerns about Federal regulation of GHG emissions potentially placing U.S. businesses at a competitive disadvantage vis-à-vis producers from countries that do not have comparable GHG regimes in place. The bill does so through its international reserve allowance provisions and, through Sec. 111(a)(7), appropriately accommodates the intent of our WTO agreements and obligations by allocating proceeds to climate change mitigation programs serving disadvantaged communities in WTO participant nations.

• Early Action Account—Another somewhat unique element of the Climate MATTERS Act is its recognition of early action taken by regulated entities to voluntarily reduce greenhouse gas emissions prior to the implementation of a regulatory mandate to do so. The city of Austin, and in particular its municipally owned and operated electric utility, Austin Energy, are widely acknowledged as national leaders on energy efficiency, demand side management, development of renewable energy resources and deployment of advanced clean energy technologies. Likewise, we are now implementing a voluntary carbon cap and reduction plan at Austin Energy which will, in part, involve the voluntary purchase and retirement of carbon offset credits. We have implemented the above strategies because our citizens believe we should play a role and pay our fair share in the cost of protecting the environment and natural resources on which we all depend. And we are not alone in this. Scores of cities and regulated entities have implemented similar measures in part due to a shared sense of social and environmental responsibility. Under most of the climate change legislation that has been filed, however, regulated entities are not given credit for these actions—even though the climate protection benefits of the actions are measurable and verifiable, and even though the actions have resulted in reductions of GHG emissions that would otherwise be trapped atmospherically and would be contributing to the mounting problem which we all now face. In Sec. 9512 and Sec. 331, the Climate MATTERS Act takes an important step toward fairness in distributing the burden of paying for climate protection by crediting regulated entities for voluntary GHG emission reduction activities taken between 1994 and 2012.

As mentioned, the city of Austin has taken extraordinary steps to voluntarily reduce GHG emissions coming from our municipal and utility operations. We have also begun to implement municipal code changes that will help reduce GHG emissions throughout the community. Highlights of those measures include:

• Adoption of the Austin Climate Protection Plan, which is intended to make all municipal fleets, facilities and operations carbon neutral by 2020.
• In less than 2 years, conversion of more than half of our 4,000+ municipal fleet of vehicles and heavy equipment to biofuels and hybrid technology.
• Approximately 700 megawatts of efficiency savings at Austin Energy in the past 25 years, and a plan to achieve an additional 700 megawatts of savings by 2020.
• A doubling of our renewable energy generation from 6 percent 2 years ago to almost 12 percent today. A recent contract for the largest renewable biomass power plant in the Nation that will bring our renewable portfolio to 18 percent by 2012. And a plan to produce 30 percent of our electricity from renewable sources by 2020.
• Nationally leading building codes that will make all new single-family homes in Austin zero energy capable by 2015.
• Implementation of land-use policies to encourage dense, mixed-use, walkable and transit-friendly development that will help reduce vehicle miles traveled.

As the Mayor of Austin, I'm privileged to act as Chairman of the Board for Austin Energy. Likewise, I serve as Chair of the Energy Committee for the U.S. Conference of Mayors. In these roles, I've had the opportunity to study and learn a great deal about energy policy, and I've had the challenge of implementing climate protection policy at the local level.

In Austin, we've made great progress, and—at the risk of immodesty—I believe we serve as a national model and an indispensable city in this regard. Indeed, in the face of Federal inaction on this issue, it has been left to local governments to lead the way. The fact of the matter, however, is that our local efforts will always fall short of the GHG reductions the united global scientific community tells us we need to make.

In Austin, for example, more than half of our community carbon footprint comes from vehicle emissions. Yet, we have neither the ability nor the authority to regulate transportation fuels and vehicle emission standards. We can eliminate GHG emissions from our municipal operations, and we can meet our electric load growth through efficiency and renewables—as we're doing. But in the fastest growing big city in the fastest growing State in the Nation, we will always lose ground due to increased vehicle emissions.

This is just one example of the need we have locally for strong Federal leadership to reverse course and avoid the worst of the impacts of global climate change. We can not do it alone. As I write, Austin is hosting thousands of evacuees from Hurricane Ike—just as we did for Hurricanes Katrina and Rita. It is a stark and heartbreaking reminder of the realities we'll continue to face if the United States does not step up and take its rightful role as a world leader on this issue.

With that in mind, I would ask you to listen to the scientists who uniformly tell us of the targets we need to reach, listen to the economists who advise us on the most efficient and equitable tools for meeting those marks, and give thoughtful consideration to your respected colleagues, such as Congressman Doggett, who propose vehicles that embody the best of those ideas.

Sincerely,

Will Wynn
Mayor

Dear Congressman Doggett,

I have read the materials about your proposed Climate Matters Act, and while I am not an expert on the topic of emissions auctions and some of the other elements of the very ambitious legislation, I do know something about the clean energy alternatives we will have to transition to, in order to meet your goals. We all miss the days of gasoline under a dollar a gallon, but the good news is that if we make a commitment to reduce CO_2, as well as other emissions, Americans can find a way to make a business out of it. Although some people are frightened by the prospects of the changes ahead, I think it will be like what happens in the forest when an old tree finally falls: Many new saplings have a chance at their spot in the sun, and an explosion of growth takes place.

Your program appears to allow emission sources three options:

• First, they can reduce their own emissions, using a wide variety of clean energy or environmental technologies and strategies, only limited by our creativity;
• Second, they can purchase emissions allowances, and your bill reinvests a portion to support clean energy and environmental programs, and training;

• Third, they can purchase credits or allowances from others with opportunities to reduce emissions themselves, or help others reduce their emissions.

Each of these options allow innovation to take place within a market environment, where the most cost-effective solutions can rise to the surface. This is an important element of the plan, if I understand your strategy correctly, because we need to be sure we don't get in the way of some of the options which seem ready to replace the status quo. We have a mind-boggling array of technology emerging to make us more efficient at everything we do. We have only begun to tap the potential of renewable resources. And, there are still some tricks up our sleeves to make the old fossil fuels less troubling.

Naturally the first thing to do when you find yourself in a hole is stop digging. And, the most cost-effective strategy we can all turn to in order to reduce emissions is efficiency, in a variety of forms. The city of Austin just adopted a process for rating the energy efficiency of every home at the time of sale, and we have been working with Texas A&M's Energy System's Lab on producing a web-based energy scoring system that will be adopted for a voluntary labeling program statewide. We are working with the Texas Workforce Commission and the Texas Foundation for Innovative Communities to develop curriculum to meet the training needs for energy auditors and building science educated technicians, which we expect to explode. Austin is the birthplace of the green builder movement, and you probably know our old friend Clark Wilson, once a large tract-home builder, has reentered the business as GreenBuildersInc.com, building some of the most energy efficient homes anywhere. I could go on. It is an exciting time.

Smart energy technology is the widely-used term for simply bringing our utilities, and our use of utilities, into the digital age, but it too holds out the promise of capturing huge efficiencies. All the Texas utilities are undertaking a systematic mass deployment of digital electric meters and we are piloting two-way communicating thermostats in the urban areas, and e-Radio energy broadcasts directly to new thermostats with FM receivers. We predict that demand response will replace the last 5 percent of peak generation by 2015. One of our clients have developed the intelligence through long research that allows them, using available market data and a simple communicating thermostat, to determine the thermal performance of a building, identify homes that need energy improvements, or help the occupants modify their behavior to significantly lower their bills. The same intelligence alone allows this firm to improve the energy reduction associated with a demand response program by 10 to 15%.

Austin is moving toward an integrated system of advanced meters, but you might be surprised to know that Bluebonnet Cooperative may have the most complete system in the State at the moment. I was visiting with the General Manager today, Mark Rose, who has every customer on a communicating meter, and the system is integrated so that the customer services call center can talk to a customer while reading his/her meter on the spot. The next move will be toward time-of-use pricing signals and enabling greater control over their energy use for his customers, but notice it comes with increased customer service!

Here at Good Company Associates we are working with a coalition of utilities and technology companies to accelerate the adoption of standardized home area network equipment and controls. We have just made patent filings for a service platform that would allow premise owners to access their home or business controls remotely, or authorize a third party provider to do so on their behalf. I plan to live long enough to see this come to pass.

By the way automated reading of gas and water meters is also following on the coattails of the electric systems, but additional technologies are emerging to identify leaks in gas and water systems that will save huge amounts of energy.

We are also working with a newly patented system for thermal storage, applicable to smaller buildings including single family homes, which is being developed here in Texas. And, just down the road this side of San Antonio, a client of ours is developing electric drive systems for electric cars and electric/gas hybrids, and onboard idle reduction equipment for large transport vehicles.

Many people will point out that we can't "save our way out of the energy crisis," and that is certainly true, but it will make it a lot easier for us to maintain higher lifestyles with the renewable energy resources we have. I'm proud to have helped develop our first Texas commercial wind farm in 1995, and to know that the State has now surpassed every other State in wind capacity installed. Our new $5 billion commitment to building transmission to the windy areas of West Texas will make way for at least a doubling of the capacity here, and also open the way for development of solar systems in those desert areas that can share the transmission lines, because the wind seems to blow least when the sun shines the brightest there.

These developments are driving a tremendous wealth to West Texas landowners. Texas was just chosen for one of two sites for national wind turbine component testing, and we are working to help assure a cluster of related businesses grow up around this important new center. In addition, we are currently undertaking a significant multi-client study of large-scale energy storage, and how it might complement this explosion of resource projects in Texas. With so many salt dome storage sites holding natural gas or chemicals in the State today, we have the know-how and technology to develop compressed air energy storage as well.

I'm surprised by how few people know that only about 9,000 feet under most of East Texas the Earth reaches temperatures over 250 degrees Fahrenheit. And, the entire Texas-Louisiana coastline is a geo-pressurized zone that has pockets of substantial reserves of pressurized steam, often found in conjunction with natural gas. We have drilled so many holes in the ground down here that it is the most studied and best understood geology in the country. In past years, the U.S. Department of Energy spent about $140 million to explore this, but found (in 1990) that the cost of production would not support competitive pricing—which at the time was about $1.20 per Mcf for gas and 2 cents per kWh for electricity at wholesale! Today things look quite differently. In the U.S. alone over 100 new geothermal power projects are on the drawing boards or under construction. Texas has yet to announce its first project (about 80% of the U.S. capacity is in California), but the UT Bureau of Economic Geology estimated years ago that we could provide almost 30% of the State's current power from this resource, and I think that was conservative. We know how to develop underground resources better than anyone in the world and there are at least two companies in Houston that can build the above ground plant for this resource. We predict geothermal is the next big renewable resource.

One of our clients just inked a deal with Austin Energy for a 20 year contract to provide 100 MW of wood fired biomass energy to the city, and let me tell you the county judge of Nacogdoches came to town just to testify for the contract's acceptance. A lot of paper mills have shut down in that part of East Texas and this project is going to put a lot of woodland owners and loggers in the black again, with long-term supply contracts. We know of two more projects under development already.

I know I'm leaving a lot of good folks out of my rambling coverage of the exciting new saplings struggling for the light, but before I stop I want to point out that there are some pretty creative people trying to figure out how to use the high quality fossil resources we have, while limiting the impact. The folks at Skyonics, here in Austin, have developed a chemistry process that was being tested at the Fayette coal plants. I'm not a chemist, but they basically bubble the coal emissions through their chemical plant and separate out all the emissions. The process removes most of the carbon dioxide, turning it into sodium bicarbonate (baking soda), and even results in a net production of hydrogen. I talked to the then President of what is now Luminant, and asked him if the fact that it could consume about 25% of the power plant energy to accomplish this feat was exorbitant, and he said that this is about what all the various options seem to require, whether on the front end or the back. So it isn't that we can't get there, even with coal, it's just a question of what is the most cost effective.

The biggest challenge ahead of us is that we are in the process of doubling the number of people that work in the energy business. It might not always look like the energy business, like the home area network Geek Squad, but it will all be related to helping us save or generate more, cleaner energy. Efficiency replaces the consumption of fuel with labor and capital equipment. Smart energy technologies replace energy consumption with intelligence. Renewables replace the consumption of stocks of high qualify fossil fuels with labor and more distributed but sustainable resource flows.

Beating climate change could be the stimulus for a tremendous technology and economic development response, and I can see the outlines of it already. Let the future come. Thank you for your leadership.

Best regards,

Robert J. King, P.E.
President
Good Company Associates

Statement of Shawnee Hoover

Mr. Chairman and Members of the Committee, thank you for your efforts to explore policy options to address and regulate global warming pollution. Friends of the Earth was founded nearly 40 years ago and is a national environmental organization with more than 2 million members and supporters worldwide. Friends of the Earth U.S. is a founding member of Friends of the Earth International—a network of member organizations in 70 countries. It is the mission of Friends of the Earth to create a more healthy and just world. In serving its mission to protect people and the environment, it is notable to mention that Friends of the Earth has been working on tax, trade and finance policy since the early 1980s.

Role for Ways and Means Committee

It is highly appropriate that the House Ways and Means Committee take a serious interest in the regulation of carbon pollution. Irrespective of which committee holds primary jurisdiction over climate legislation, the House Ways and Means Committee, by way of its unique jurisdiction areas, will play a critical role in helping our Nation achieve aggressive greenhouse gas (GHG) reduction targets.[1] In consideration of a Federal climate policy, we submit several policy suggestions for the Committee to consider that include the Tax Code, protecting American families and uses of complementary policies. We also highlight potential pitfalls to be considered in a cap and trade program and encourage the Committee to support positive international engagement toward a global climate agreement.

Decarbonizing the Tax Code

With the impeding climate and energy crisis, we need to move rapidly to reform the old purposes of energy tax preferences that primarily benefit fossil fuels. The Tax Code will be an essential tool to help guide our economy in a carbon-constrained world. With oil prices hovering around $100 a barrel and companies like ExxonMobil posting the highest profits in history, there is no reason to continue subsidizing oil and gas companies. Several bills have already been introduced that would begin the process of purging oil and gas tax breaks from the Tax Code.

Minimizing the global warming impact of the Tax Code will be an essential component to any climate legislation. This is done primarily by eliminating subsidies for the production and use of carbon intensive technologies and fuels (also referred to "decarbonizing the Tax Code"), while expanding incentives that encourage scaling up renewable forms of energy, conservation, and energy efficiency.

The first step in decarbonizing the Tax Code involves assessing the actual impacts of the Tax Code on global warming pollution. The House Ways and Means Committee is already taking steps to determine the footprint of the Tax Code. We thank the Committee for its ongoing advocacy for a Carbon Audit of the Tax Code.[2] If signed into law and funded, this audit could importantly inform the Committee's efforts in designing future global warming policy.

While we await the completion of this audit, there are a number of explicit energy tax preferences, breaks, and credits in the Tax Code that encourage the use of fossil fuels that can be immediately addressed. By Friends of the Earth's last count in July 2008, there are dozens of incentives in the Federal Tax Code (some relatively known, others hidden) that directly reward fossil fuel use and energy waste costing at least $32.9 billion through 2013.[3] For instance, the report took a quick look at the Joint Committee of Taxation's annual revenue expenditure report and found 12 tax preferences given to the oil and gas industry worth approximately $23.2 billion over 5 years.

Other, more subtle, preferences in the Tax Code that encourage wasteful energy use can also be found. In the housing market, the Federal mortgage interest deduction for first homes allows home buyers to deduct interest from the first $1 million of the cost of their home. With median house prices at approximately $203,000 the deduction subsidizes the purchases of oversized homes with oversized energy needs.[4]

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[1] The term greenhouse gases (GHG) or GHG pollution is used interchangeably with global warming pollution, and carbon pollution.

[2] The Carbon Audit of the Tax Code was included in sec. 14001 of H.R. 3221, the Renewable Energy and Energy Conservation Tax Act of 2007, and authorized the National Academy of Sciences to undertake the audit.

[3] "Big Oil, Bigger Giveaways: An analysis of $32.9 billion in tax breaks, subsidies and other handouts the oil and gas industry will receive by 2013." Friends of the Earth. July 2008. http://www.foe.org/pdf/FoE_Oil_Giveaway_Analysis_2008.pdf.

[4] "Existing-Home Sales Slide on Tight Mortgage Availability." National Association of Realtors. September 24, 2008. http://www.realtor.org/press_room/news_releases/2008/ehs_tight_mortgage_slide.

There is also a Federal mortgage deduction allowed for the purchase of a second home.

There has been some effort by the Committee to use the Tax Code in the automobile sector toward reducing our Nation's use of oil. The Tax Code includes a 1970's era tax on "gas guzzling" automakers that produce inefficient passenger vehicles. Yet, there exists a glaring loophole in the "gas guzzler" tax that exempts sports utility vehicles (SUVs) and other light trucks from the tax. This loophole should be closed as it, in part, undermines the penalty in the Tax Code and causes more SUVs to be bought and sold.

Ideally, the carbon audit of the Tax Code will find all the carbon leaks, or areas where high carbon use is rewarded rather than discouraged. The mortgage interest deduction and the "gas guzzler" loophole are just two examples of tax preferences that at first blush do not appear related to energy but which, in reality, have enormous impacts on our energy use—and certainly there are more.

As we take care of the carbon leaks by decarbonizing the Tax Code, Congress has the opportunity to reinforce and increase many of the tax credits meant to make our economy energy efficient and shift our energy consumption away from fossil fuels. This should include finally adopting a long-term renewal of the Section 45 renewable energy tax credit. It is our hope that this credit will no longer be needed after roughly 10 years. But until that time, wind energy development needs help through the Tax Code to level the regulatory and financial playing field that heavily favors traditional sources of energy. Additional incentives, such as for hybrid vehicles that push the envelope of fuel economy and incentives for technologies that increase energy efficiency, could and should also be adopted by way of the Tax Code.

Finally, there seems to be wide agreement that perhaps the greatest step the United States could take to reduce our carbon emissions and increase our efficient use of energy is to place a price on carbon. In that vein, it is time that Congress, the American public and energy and environmental advocates seriously consider the various uses and benefits of a carbon tax or fee on all carbon intensive fuels, or on specific carbon intensive uses like gasoline. Members of the Ways and Means Committee have already introduced H.R. 2069, the Save Our Climate Act of 2007 sponsored by Reps. Stark and McDermott and H.R. 3416, America's Energy Security Trust Fund Act of 2007 sponsored by Rep. Larson. These bills both utilize the Tax Code to create a tax on carbon.

Protecting America's Families

In assessing the best policy options to address global warming it is critical that our Nation's most vulnerable populations be held harmless from both the impacts of climate change and the impacts of higher prices for energy and basic goods and services. For reasons Members of Congress know well, we must take special care not to allow the transition to a clean energy economy to cause severe hardship to hard-working Americans. The mechanisms used to protect the purchasing power of lower-income households and our investments made to pull these communities out of poverty will make all the difference.

In its analysis of the distributional impacts of carbon policy designs, the Congressional Budget Office (CBO) noted that lower-income households spend a higher percentage of their income on energy costs than the rest of the population and suffer disproportionately from a rise in the costs of energy and basic necessities.[5] In a recent analysis, the CBO illustrated this point by estimating that a 15 percent cut in global warming pollution would increase the costs of households in the lowest quintile by 3.3 percent of their average income, and only 1.7 percent for households in the highest quintile.[6]

Fortunately, many in Congress recognize the need to address global warming without increasing poverty and hardship on vulnerable households through effective policy tools, as evidenced by both the Climate MATTERS Act (H.R. 6316) and iCAP (H.R. 6186). It is paramount in any climate bill design that (1) a sufficient amount of resources is designated specifically for low- and moderate-income households, (2) rebates or similar income recycling is delivered fairly and through effective delivery mechanisms, and (3) additional investments focus on revitalizing lower-income communities toward decreasing carbon dependence and increasing job opportunities.

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[5] "Who Gains and Who Pays Under Carbon-Allowance Trading? The Distributional Effects of Alternative Policy Designs," Congressional Budget Office, June 2000. http://www.cbo.gov/doc.cfm?index=2104.

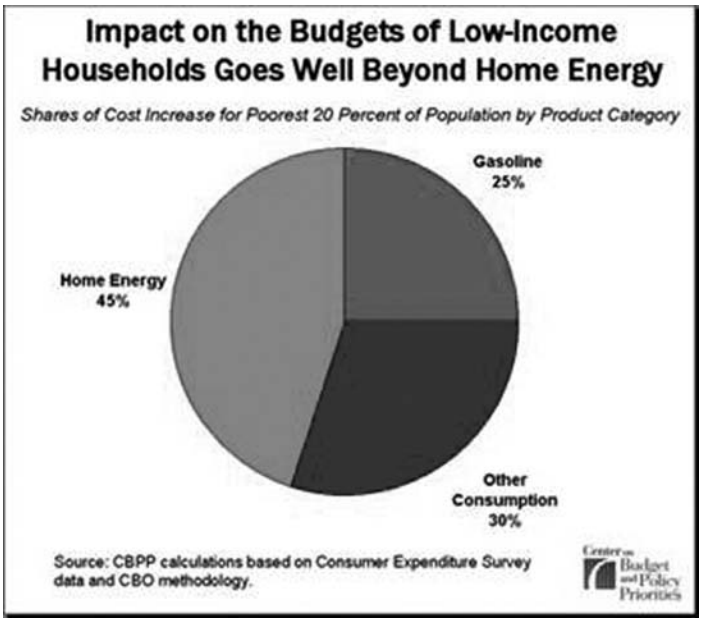
[6] "Trade-Offs in Allocating Allowances for CO_2 Emissions," Congressional Budget Office, April 25, 2007. http://www.cbo.gov/ftpdocs/80xx/doc8027/04-25-Cap__Trade.pdf.

Devote Sufficient Resources to Low- and Moderate-Income Households

It is important that any climate policy is not just efficient, but fair as well. There are both moral and political reasons for this. Fairness has always been a cornerstone principle of the American polity. Fairness in a climate policy also has clear political merits. As the authors of a policy paper for the Pew Center on Global Climate Change rightly stated, "Even the most cost-effective program design may be unacceptable if its costs are distributed in such a way that is perceived to be unfair."[7] Such insight could apply both to auctioning all the permits in a cap and trade program as well as to providing a safety net for low- and moderate-income families. A climate policy can and should be designed in a way that does not increase poverty levels and that is not regressive—that is, in a way that does not disproportionately burden lower-income households. The aim is not just to protect those who are already living near or below the Federal poverty line (typically the bottom income quintile)—but to provide a safety net also for the 40 percent of all households that make up the moderate-income and lower-income scale of middle class families. They too will face decreases in their purchasing power. Congressman Markey's iCAP bill is a good example of the resources needed to provide a sufficient safety net for vulnerable households.

Lastly, while it is important to offset increases in home energy costs, that alone will not suffice as home energy costs are just a part of the total consumer costs of a cap on carbon pollution. According to the Center for Budget and Policy Priorities (CBPP), a majority of such costs will come from transportation, and energy-sensitive goods and services. CBPP calculates that home energy costs will account for less than half (45 percent) of the impacts on the budgets of the lowest income households (Figure 1).

Figure 1: Impacts of a Carbon Cap on the Budgets of Low-Income Households



Utilize Effective Delivery Mechanisms to Offset Costs

The delivery mechanisms used to offset the impacts on low- and moderate-income households will in large part determine the effectiveness of any climate policy. The aim should be to use a range of delivery mechanisms that will compensate the highest portion possible of the target population. Uses of the Tax Code, such as assisting low wage workers through the Earned Income Tax Credit (EITC) are essential. The Tax Code alone will not reach the majority of those in need who may be unemployed,

[7] Nordhaus, Robert and Kyle Danish, "Designing a mandatory greenhouse gas reduction program for the U.S.," Pew Center on Global Climate Change, May 2003.

underemployed, disabled, or retired and do not file taxes. Other efficient delivery mechanisms include: electronic benefit transfer (EBT) systems used by State assistance agencies to provide food stamps and Medicare benefits; the Low Income *Home Energy Assistance Program* (*LIHEAP*); and the Weatherization Assistance Program.

A climate policy must also recognize that low- and moderate-income households will require immediate income protections as well as longer-term cost mitigation strategies. The delivery mechanisms described above can efficiently and effectively return lost purchasing power to households. Longer-term cost mitigation strategies include making lower-income households more energy efficient, either through efficiency programs overseen by the State or provided by the Weatherization Assistance Program.

Avoid Cash Grants to Investor-Owned Local Distribution Companies

Some Members tend to favor the concept of giving Federal grants directly to Local Distribution Companies (LDCs), or utilities, to distribute to low-income families through efficiency programs. Friends of the Earth finds this approach riddled with problems. Many advocates for lower-income energy consumers oppose direct Federal grants or funding of local utilities in order to establish or increase low-income energy efficiency programs.

While some LDC demand-reduction strategies may be able to provide efficiency services through longer-term weatherization programs, such an approach is not a substitute for immediate relief provided by Federal rebates delivered through proven and effective mechanisms. Weatherization programs take time and are an uncertain mechanism for ensuring that lower-income households are cushioned from increased energy-related costs. They would likely fail to account for price impacts that fall outside utility costs alone. According to the CBPP, LDCs may also miss large numbers of target households, including "the significant share of low-income households who do not pay utility bills directly because the bills are paid by their landlords (and reflected in their rents). Many other low-income households will fall through the cracks since most utility companies cannot easily identify which of their consumers have low incomes (other than households facing shut-offs)."[8] Overall, a direct consumer rebate delivered through effective mechanisms, such as the EITC and EBT, and that takes into account additional factors, such as rural/urban location and region of residence, is a much more fair way to provide immediate relief to lower-income households.[9]

It should also be noted that direct Federal grants to investor-owned LDCs would be unprecedented. The established U.S. framework for funding LDC efficiency programs, under the oversight of State regulators and agencies, has been achieved without any publicly funded grants directly to LDCs.[10] In 2007, more than 300 major investor-owned local utilities, both gas and electric, spent nearly $361 million on low- and moderate-income efficiency programs in 43 States.[11] The funding was collected from ratepayers according to rate schedules established by State regulatory commissions or, in a few States such as California, Wisconsin, and Nebraska, funded by utility fees mandated by their State legislatures.[12]

The wide range of program designs approved by regulators and legislators over the past 25 years have together produced usage and cost reductions without direct grants. Low-income programs are subject to cost effectiveness tests and most are managed so that they are a benefit to the utility, its ratepayers and the public in numerous ways. Those include peak load reduction, slowing the demand for building new generating capacity, decreasing bad debt write-offs, and customer service costs. When emission reductions can be quantified, those benefits will also accrue to the utility.[13] There is a wide variation among the initiatives and their cost-effectiveness.

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[8] "Low-income provisions of the Boxer substitute to Lieberman-Warner," Center for Budget and Policy Priorities, May 30, 2008.

[9] For more on varying cost impacts, see: Eisenberg, Joel F., "The Impact of Carbon Control on Electricity and Gasoline Expenditures of Low-Income Households," Oak Ridge National Laboratory, April 2008. http://weatherization.ornl.gov/pdf/CON-504.pdf.

[10] Personal communication with Meg Power, Senior Policy Advisor, National Community Action Foundation, September 2008.

[11] Two sets of State reports provide annual data. The State supplement report of the HHS Office of Energy Assistance catalogs the value of non-Federal contributions to low-income energy programs coordinated with State LIHEAP and weatherization programs and offers some details on LDC initiatives. http://liheap.ncat.org/Supplements/2007/supplement07.htm. The National Association for State Community Services Programs also collects annual reports of non-Federal funding that supplements the States' weatherization program. http://www.waptac.org/sp.asp?id=9014.

[12] Personal communication with Meg Power, Senior Policy Advisor, National Community Action Foundation, September 2008.

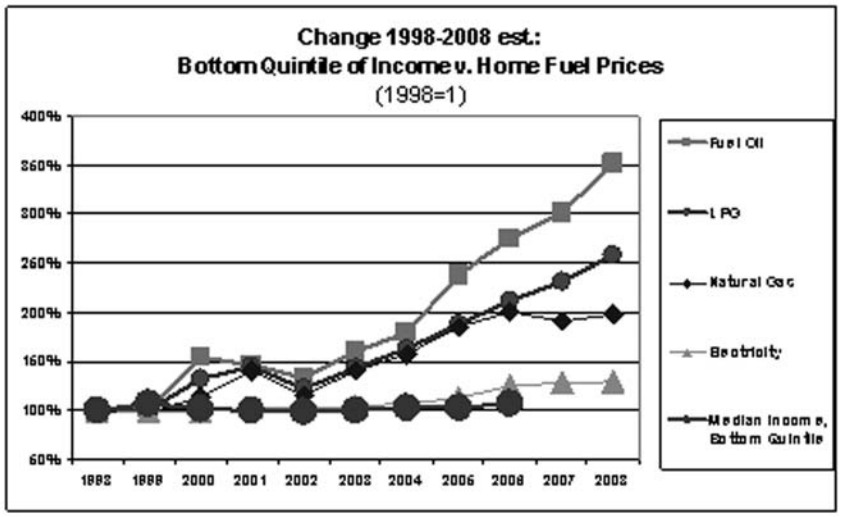
[13] Ibid.

Evaluations of LDC initiatives have demonstrated that those that are delivered in coordination with and by the State weatherization program delivery system have the best outcomes. The established financing and oversight framework for these investments can provide ample guidance for future State initiatives.[14]

Focus on Revitalizing and Retrofitting Lower-Income Communities

Low- and moderate-income households have a greater risk of being permanently harmed by climate change-related impacts, such as fierce storms, floods, droughts and fires, than higher-income households. The reason for this is twofold. First, they are typically located in economically depressed areas that lack the resources to invest in adequate disaster preparedness or to provide sufficient disaster relief. Second, because they have lower incomes and occupy older homes in communities with aging commercial and public buildings and equipment, they and their communities lack the capital to upgrade (Figure 2). These populations also suffer disproportionately from cancer, asthma and other respiratory ailments likely due to their close proximity to power plants, toxic waste dump sites and other results of our current pollution-based economy.[15]

Figure 2: Changes in Bottom Quintile Incomes Compared to Energy Costs



Policies can and should be designed to offset the impacts of capping carbon on vulnerable households using effective policy tools and strategies. The incomes of the bottom quintile, like those of moderate-income households, have not increased as fast as the prices of energy. These households, which include families of low-wage workers, have seen a steady decline in their purchasing power and have severe trouble meeting their basic needs.

In general, low-income households use less energy and cause fewer GHG emissions. Yet, the intensity of energy use and carbon emissions is greatest in these homes and communities. Therefore, these communities offer the most opportunity for lower intensity of emissions and change.

It is critical that a strategy to protect lower-income households and communities include separate, additional funds and strategies to help both lift them out of poverty and a high dependence on fossil fuels. To help build the resilience of these communities to the impacts of climate change and to help transition our Nation to a clean energy economy, they need and deserve a focused access to "green-collar" jobs

[14] Kushler, Martin (Ph.D.), Dan York, Ph.D. and Patti White. "American Council for an Energy-Efficient Economy. Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs," September 2005. The report summarizes common characteristics which include close coordination with weatherization assistance and other State low-income programs and vigilant monitoring and results measurement. Program features offer guidance on best practices. For a list of such studies see: http://www.opportunitystudies.org/repository/File/energy__affordability/Energy__Program__Evaluation__List.pdf.

[15] Hoerner, Andrew and Nia Robinson. "Climate of Change, African Americans, Climate Change, and a Just Climate Policy for the U.S.," Environmental Justice and Climate Change Initiative, July 2008. http://www.ejcc.org/climateofchange/index.html.

and skills training. Because they often receive government assistance, lower-income communities are prime candidates for weatherization and renewable energy retrofits, carbon-reducing green building incentives and standards, new and better access to public transportation and carpooling programs, and new job opportunities and training. Most importantly, a focus on revitalizing and retrofitting lower-income communities can help increase skills and wages that will serve to provide a pathway from poverty to economic self-sufficiency and strengthen the middle class.

Cap and Trade Program: Importance of Auctions and Complementary Policies

While there may be a role for a cap and trade program in a Federal approach to reducing U.S. global warming pollution, the design of such a program must be approached with fairness, prudence and caution. In considering the design of such a program, one of the most critical considerations is how the pollution permits (sometimes referred to as allowances) will be distributed. Additionally, proper attention should be paid to which emissions may be better captured outside a carbon trading program, and the ability to provide proper oversight over the various parts of a cap and trade program. Many proposals coming before Congress treat a cap and trade (or carbon trading program) as the only or most important tool to reduce GHG emissions. Such an approach is not the only possibility however. For example, the design of California's global warming law, AB32, is likely to rely on carbon trading for only one-fourth of its overall emissions reductions.[16] The majority of California's emissions reductions are expected to come from complementary policies, performance standards and other strategies outside the carbon trading.

Importance of 100 Percent Auctioning of Pollution Permits

A tremendous debate is occurring in Congress around the potential method of distribution of pollution permits in a Federal cap and trade program. There are two options for how the government distributes pollution permits created by a cap and trade program—it can either give them away to polluters for free, also known as "grandfathering," or it can auction them.

The results of this debate will ultimately define the success or failure of efforts to regulate global warming emissions under a cap and trade program. Auctioning pollution permits would help ensure that the implementation of global warming legislation is done in an equitable way consistent with the "polluter pays principle." Failing to auction permits would hinder the government's ability to collect revenue to protect low- and moderate-income households and to ensure that the United States maintains its commitments to fund international adaptation and clean energy transfers to developing countries.

Auctioning permits would also be better for the economy. The CBO cites studies that find that auctioning permits would be 2–3 times less costly to the economy and could provide a net gain to the economy if the revenue was used to reduce individual income taxes.[17]

Climate Equity

Efforts to create a cap and trade program will create winners and losers in the marketplace and amongst energy consumers. Any policies aimed at reducing global warming pollution will inevitably have an upward effect on energy prices. This will occur whether pollution permits are auctioned or not. Under a cap and trade program, according to the CBO, "If the government wanted to provide the same level of services without increasing the budget deficit, it would have to either raise taxes or use part of the value of the allowances to cover the changes in Federal outlays and revenues."[18]

In the interest of fairness and equity, taxpayers would not be getting a fair deal if pollution permits were given freely to polluters. Robert N. Stavins of The Brookings Institute put it this way: "In a competitive market the benefits of free allowances generally accrue only to their recipients, increasing their profitability or wealth, and generally do not benefit the consumers, suppliers, or employees of those recipients. Hence, although the cost of allowance requirements can be expected to ripple through the economy, the benefits of free allocations will not."[19]

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[16] Under AB32, carbon trading is supposed to reduce GHG emissions by 35 million megatons of CO_2e ($mmtco_2e$). Other recommended strategies are aimed to reduce emissions by 112 $mmtco_2e$. See: Climate Change Draft Scoping Plan, June 2008. Discussion Draft pursuant to AB32, pages 17–18, http://www.arb.ca.gov/cc/scopingplan/document/draftscopingplan.pdf.

[17] "Trade-Offs in Allocating Allowances for CO_2 Emissions," Congressional Budget Office, April 25, 2007. http://www.cbo.gov/ftpdocs/80xx/doc8027/04-25-Cap__Trade.pdf.

[18] Ibid.

[19] Stavins, Robert N. "A U.S. Cap and Trade System to Address Global Climate Change." The Brookings Institute, October 2007. http://www.brookings.edu/~/media/Files/rc/papers/2007/10 climate__stavins/10__climate__stavins.pdf.

When permits are auctioned the government collects revenue and can redirect those funds back to energy consumers to lessen the burden of increased costs. Additionally, revenue could be directed toward investments in renewable energy research to help the energy transition away from fossil fuels, and to assist developing countries to battle the global climate crisis and reduce their own emissions. If permits are given for free, energy prices will rise but the government does not collect any funds to aid our Nation's transition to a clean energy economy.

A common misconception is that companies that receive free pollution permits will not pass the cost onto consumers in the form of higher prices. Such thinking is false. According to economist Jim Barrett, President of Redefining Progress, a public policy economic think tank, "While it is a common understanding that auctioned permits will result in higher energy and other product prices much the same way that an equivalent fee on carbon emissions would, it is often erroneously assumed that free permit allocations will not. ... This reasoning is incorrect. Cap and trade systems increase energy and product prices because of the scarcity they introduce. That scarcity is what drives the price increases, not the method of permit distribution." [20]

The CBO added this explaination, "Although producers would not bear out-of-pocket costs for allowances they were given, using those allowances would create an 'opportunity cost' because it would mean foregoing the income that they could earn by selling the allowances. Producers would pass that opportunity cost on to their customers in the same way they would pass along actual expenses." [21]

Such impacts were witnessed first hand during the first phase of the European Trading System (ETS) where the majority of pollution permits were given to polluters for free. Instead of using the value of the permits to lower prices, the companies continued to pass the costs on to energy consumers and in the process gained windfall profits.[22]

Polluter Pays Principle

The principle of making polluters pay for their pollution is a long held principle in environmental protection and regulation. This has the economic impacts of forcing polluters to "internalize" their pollution costs, which incentivizes them to adopt new processes and technologies to eliminate these additional costs. The concept is simple, air is a public resource that polluters should not be allowed to use and compromise free of charge or without consequence. Grandfathering polluters with free permits actually rewards them for their previous harmful activities with windfall profits.

Economists strongly warn against the impacts of giving permits away for free. According to economist Jim Barrett, "Even under mild assumptions, free permit distributions would represent the largest windfall distribution of wealth in this country's history. Households, businesses and industrial energy consumers will transfer their wealth to the owners of energy producing companies, already among the richest corporations in the world." [23]

The CBO concurs, "Giving away allowances could yield windfall profits for the producers that received them by effectively transferring income from consumers to firms' owners and shareholders." [24] In congressional testimony to the Select Committee on Energy Independence and Global Warming, Robert Greenstein, President of the Center on Budget and Policy Priorities, stated, "If companies receive allowances for free, they will still be able to charge the higher price—they will be able to charge what the market will bear—and will reap what CBO has termed "windfall profits." [25]

Lastly, auctioning 100 percent of pollution permits created under a cap and trade program allows the market, and not the government, to determine winners and losers. If Congress gives pollution permits away for free it opens the door to a political

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[20] Barrett, James, Ph.D. "True Cost of Free Pollution Permits: A Redefining Progress Issue Brief." Redefining Progress, February 2008. http://www.rprogress.org/publications/2008/True%20Cost%20Issue%20Brief%2002–08.pdf.

[21] "Trade-Offs in Allocating Allowances for CO_2 Emissions," Congressional Budget Office, April 25, 2007. http://www.cbo.gov/ftpdocs/80xx/doc8027/04–25–Cap__Trade.pdf.

[22] "EU ETS Phase II—The potential and scale of windfall profits in the power sector." Point Carbon Advisory Services, March 2008.

[23] Barrett, James, Ph.D. "True Cost of Free Pollution Permits: A Redefining Progress Issue Brief." Redefining Progress, February 2008. http://www.rprogress.org/publications/2008/True%20Cost%20Issue%20Brief%2002–08.pdf.

[24] "Trade-Offs in Allocating Allowances for CO_2 Emissions," Congressional Budget Office, April 25, 2007. http://www.cbo.gov/ftpdocs/80xx/doc8027/04–25–Cap__Trade.pdf.

[25] Greenstein, Robert. Testimony for Hearing on "Cap, Auction, and Trade: Auctions and Revenue Recycling under Carbon Cap and Trade." January 23, 2008. http://globalwarming.house.gov/tools/assets/files/0321.pdf.

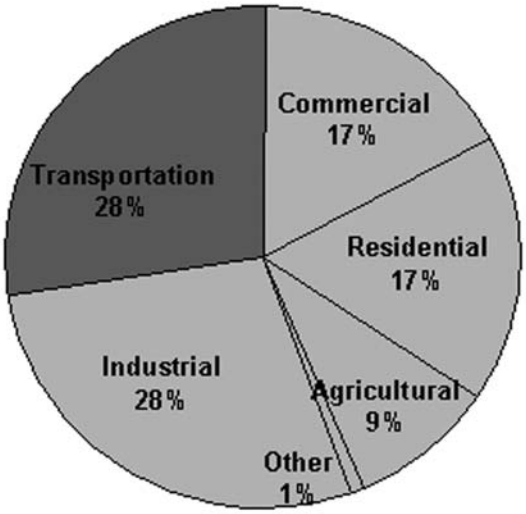
slippery slope of intense lobbying that plays to the strengths of the polluting industry over the public benefit.

Complementary Policies: Transportation and International Forests

The transportation sector is a prime example within our economy where, as described below, a complementary policy would be more effective than carbon trading at reducing emissions.

Reducing emissions in the U.S. transportation sector is integral to climate policy. Currently, nearly one-third of total U.S. GHG emissions originate from the transportation sector, making it the Nation's largest end-use source (Figure 3).[26] Transportation is also the Nation's fastest growing source of U.S. GHG emissions, accounting for 47 percent of the net increase in total U.S. emissions between 1990 and 2003.[27] In order to meet and preferably exceed the targets that the Intergovernmental Panel on Climate Change (IPCC) has identified as necessary to avoid the worst impacts of global warming, it is imperative to achieve significant GHG reductions in the transportation sector. Failing to make substantial emissions reductions from transportation means that additional reductions will have to be made up by other sectors of the economy if we are to meet overall emissions reduction targets. This will increase costs on other economic sectors such as electricity producers or industry. Moreover, failing to address transportation sector emissions will drive up the cost of making these reductions in the future.[28]

Figure 3: U.S. EPA 2005 Greenhouse Gas Emissions by End-Use Sector



As Congress debates the implementation of a cap and trade program for reducing GHG emissions across the economy, it is important to evaluate how best to achieve GHG reductions in the transportation sector. Cap and trade can provide a powerful tool for achieving GHG reductions in some areas of the economy. However, a growing number of transportation and climate change experts are concluding that we should not expect a cap and trade policy to bring about efficient GHG emissions reductions in the transportation sector.[29] As such, complementary policies are needed to accomplish this goal, especially in the long run.[30] It is therefore important for

[26] U.S. EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2005.
[27] U.S. EPA, accessed at http://www.epa.gov/omswww/climate/index.htm on 9/3/08.
[28] Gallagher, et. al. Policy Options for Reducing Oil Consumption and Greenhouse-Gas Emissions from the U.S. Transportation Sector. John F. Kennedy School of Government, Harvard University, 2007.
[29] Greene, David L., Ph.D. Oak Ridge National Laboratory. Testimony to the Senate Environment and Public Works Committee, June 2008.
[30] Ibid.

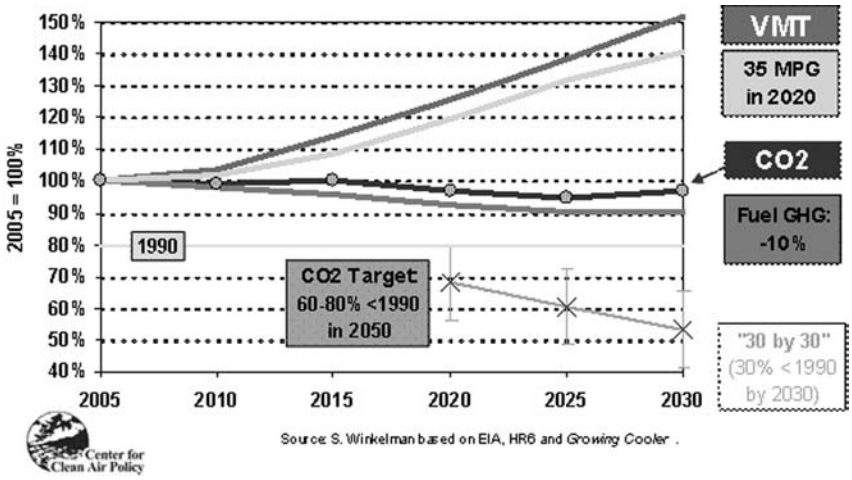
the Committee to evaluate the inclusion of a set of complementary transportation policies in addition to carbon trading.

Congress has already pursued several important complementary policies in the transportation sector in an effort to reduce oil consumption, GHG emissions, and air pollution, as well as saving consumers money on gasoline. These include raising vehicle efficiency standards through **Corporate Average Fuel Economy (CAFE)** regulations and low-carbon fuel standards (LCFS).

The policies for developing our surface transportation infrastructure in the U.S. are not designed to take into account GHG emissions. Transportation spending is largely focused on roads and highways, and the majority of travel in the U.S. is by personal vehicle, which is among the least efficient passenger and freight transportation modes. As a result, 81 percent of transportation GHG emissions (equaling nearly a quarter of total U.S. GHG emissions) are due to gasoline consumption—62 percent from personal vehicles, and 19 percent from freight trucks.[31] Current trends dictate that these numbers will rise in coming decades and double by the year 2030.[32]

This projected increase will have a significant increase on transportation sector GHG emissions. Additional emissions resulting from the projected increase in driving rates will overwhelm the emissions reductions expected from new vehicle efficiency standards requiring the U.S. auto fleet to average 35 miles per gallon by the year 2020 and the required 10 percent reduction in the carbon content of vehicle fuels mandated by the 2007 Energy Independence and Security Act (H.R. 6). In other words, projected increases in driving rates will result in a net increase of total GHG emissions from the transportation sector despite projected emissions reductions from both CAFE and the LCFS. Ignoring increasing driving rates will push overall transportation sector GHG emissions 26 percent greater than 1990 levels in 2030 (Figure 4).[33]

Figure 4: Transportation Sector CO_2 Emissions Forecast 2005–2030



In this graph, the dark blue line represents transportation sector GHG emissions, the light blue line represents emissions in 1990, and the orange line shows the approximate path of reductions needed to achieve IPCC recommendations. The purple line shows a 10% reduction in fuel carbon content, the green line shows an increase to a 35 mpg CAFE standard and the red line shows projected VMT. Each of these

[31] U.S. EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2003.

[32] U.S. Department of Energy/Energy Information Agency (USDOE/EIA): Annual Energy Outlook, 2007. The trend between 1977 and 2001 has been an increase in driving rates—measured in vehicle-miles traveled (VMT). While the U.S. population increased by 30 percent, driving rates grew by 151 percent. In this same period, trips per capita, average trip lengths, and the proportion of drivers travelling alone all increased to varying degrees. See Polzin, Steven, "The Case for Moderate Growth in Vehicle Miles of Travel," 2006.

[33] Winkelman, Steve. Center for Clean Air Policy.

three lines influence the dark blue GHG trend. The graph shows that the GHG reductions achieved from CAFE and low-carbon fuels will be negated by rising VMT.

The problem underscoring the trend in America's increased oil use in the transportation sector is largely due to a lack of alternative transportation options, inefficient land use and development patterns, and inadequate traffic management.[34] This has led transportation and climate policy experts to conclude that we should not expect the small increase in gasoline prices from a Federal cap and trade program (~$0.037 annually or $1.40 cumulatively through 2050) to bring about an efficient reduction in driving rates and transportation sector GHG emissions.[35, 36] Complementary transportation infrastructure and land-use policies are needed to accomplish this goal, especially in the long run.[37] A recent survey of decade's worth of data confirms that such complementary policies can have a significant impact on travel behavior in the U.S. in a way that reduces transportation sector emissions. Given the right incentives and legitimate alternatives, Americans will choose to drive less.[38]

Public transportation and other mass transportation modes, such as passenger rail, are shown to make significant contributions toward GHG emissions reductions. According to the Science Applications International Corporation (SAIC), in 2005, public transportation reduced carbon emissions by 6.9 million metric tons.[39] This includes both emissions reductions from reduced driving rates and reduced traffic congestion. There is great potential for further emission reductions; according to the same SAIC report. A single commuter can reduce their CO_2 emissions by an average of 20 pounds per day, or more than 4,800 pounds annually, by commuting on public transportation instead of driving.[40] At the local level, this means developing transit systems such as light rail, commuter rail, and rapid bus service. For longer-distance intercity travel, especially for trips between 50 and 500 miles, passenger rail, such as the service provided by Amtrak and several State departments of transportation, is an energy-efficient option that can help reduce the GHG emissions of long-distance travel.

A U.S. climate policy that includes a complementary policy that sets forth increased alternative transportation options, efficient land use and development patterns, and better traffic and road management could yield a profound reduction in transportation sector emissions when aggregated nationwide. Such a policy will reduce the burden on other sectors to make up for the emissions increases in the transportation sector and ultimately make it more likely that we meet our Nation's economy-wide reduction targets.

International Forest Protection Through Policy Coherence

Deforestation and forest degradation is a major source of greenhouse gas emissions, accounting for nearly 20 percent of emissions globally. The growing rate of forest loss also threatens the world's biodiversity and imperils the 1.6 billion people who are dependent on forests for their livelihoods. A new global interest in addressing climate change, and a particular interest in reducing emissions from deforestation and degradation, provides an important opportunity to address the real need for improved forest governance structures, while simultaneously conserving biodiversity and safeguarding the rights of the indigenous peoples' and other forest dependent communities.

At the Bali 2007 Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC), reducing emissions from deforestation was a major topic of discussion. Developing policy options to reduce emissions from deforestation and degradation was also included as a key component of the Bali Action Plan, which consists of multiple decisions necessary to secure emissions reductions in global climate negotiations. Assistance from the United States for this sort of initiative will be critical in moving towards a global agreement. While some are demanding the dubious use of international forest offset projects to qualify for domestic emissions reductions, others are arguing that an international fund under the

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[34] Ewing, Reid, Pendall, Rolf, and Chen, Don. Measuring Sprawl and It's Impact. 2002.

[35] EPA Analysis of the Lieberman-Warner Climate Security Act of 2008 (S. 2191) in 110th Congress. 2008.

[36] Greene, David L., Ph.D. Oak Ridge National Laboratory. Testimony to the Senate Environment and Public Works Committee, June 2008.

[37] Ibid.

[38] Ewing, Reid, et al. *Growing Cooler: The Evidence on Urban Development and Climate Change*. 2007.

[39] Davis, Todd and Monica Hale. "Public Transportation's Contribution to U.S. Greenhouse Gas Reduction." SAIC. September 2007.

[40] Ibid.

UNFCCC, in support of global agreement on climate change, would be a more secure and equitable way to achieve reductions.

To be true, effective and just, any mechanism to reduce emissions from deforestation and degradation must. To best get at the deforestation problem through funding is to (1) prioritize the development of coherent national policy frameworks and law enforcement (2) must address the underlying drivers of deforestation; and achieve policy coherence in consuming countries and (3) safeguard and enhance the land tenure and other of local communities; as well as ensure that indigenous and traditional forest-dwelling peoples play a central role in forest management.

To promote effective governance, funds should support national, regional and local governments in recipient countries in enacting and enforcing comprehensive national forest policies. Further, the central role of indigenous and traditional forest dwelling peoples, including land tenure rights, should be clearly recognized. Large areas of forested land are under management of indigenous peoples who do not yet have legal title to their ancestral lands, and securing clear land tenure rights is vital in ensuring responsible management of these forests. Because indigenous peoples who hold secure land tenure for their lands effectively manage their forests sustainably, securing land tenure has proven a highly cost-effective tool in achieving emissions reduction. Systematic monitoring programs and verification programs, not enabling carbon offsets schemes, will also be critical for forest-rich countries to effectively engage in international climate agreements.

Illegal logging and associated trade are both indicators of and perpetuators of poor forest governance. In particular, the U.S. Forest Service is well suited to assist in the implementation of the recently passed Lacey Act, which by prohibiting the import and trade of illegally sourced timber and wood products, uses the U.S. market and legal leverage to support better enforcement, governance and supply chain reform in global wood markets.

International Forest Offsets As Part of a Cap and Trade Program Not An Option

Global deforestation accounts for 20 percent of global GHG emissions, and therefore many are looking to the preservation or restoration of forests as a prime area of achieving the U.S.'s emission reduction targets. Yet, using international forest offsets as a way to meet domestic reductions targets may be a red herring as they remain a dubious mechanism to achieve verifiable and permanent reductions. While international offsets would provide an out for reducing emissions here at home, avoiding emissions reductions at home is likely to avoid the fundamental changes necessary to deliver emissions reductions to keep us from facing climate catastrophe.

International forest offset projects suffer from similarly problematic structural design concerns in meeting their criteria, such as ensuring reductions are additional, real, and permanent, as do non-forest project based offsets. Significant technical issues plague the forest offset market, including the capacity to adequately assess and monitor actual emissions reductions from deforestation, even using remote sensing techniques, as well as concerns over whether emissions reductions activities in forest areas can in reality be permanent.

The inclusion of international forest carbon offsets as a U.S. climate mitigation strategy will potentially exploit the cheapest emissions reductions projects available to developing countries in their very own country. According to recent studies, 500 million tons of carbon dioxide emissions could be offset in tropical rainforests at roughly $2 per ton—well under the projected prices for carbon credits in a cap and trade system.[41] If industrialized countries buy all of these cheap credits to count as their own domestic emissions reductions, it leaves very little opportunity for those developing countries to meet the international pressures for them to implement climate mitigation policies of their own in a cost-effective manner. Indeed, it will leave those developing countries with only the most expensive mitigation options. The sovereignty of host nations is also under question due to the liability constraints of potential future emissions.

Additionally, unrelated to emissions reductions, many offset projects have created or exacerbated existing social and environmental problems. For example, plantation projects have created water pollution, and projects to capture methane gas from landfills have not addressed the toxic pollutants generated by the landfill.

The Plantar Project in Minais Gerais, Brazil, demonstrates how projects may generate social and environmental problems unrelated to carbon reductions. As de-

[41] Rainforest conservation could offset 500m tons of CO_2 emissions at $2/ton. Mongabay, July 24, 2008. http://www.climateark.org/shared/reader/welcome.aspx?linkid=103671&keybold=forest%20carbon%20avoided%20deforestation.

scribed by the Institute for Policy Studies Sustainable Energy and Economy Network:

In 2002 Plantar, an iron foundry company with operations in Brazil, threatened to switch from burning charcoal to coal in order to increase capacity at its pig iron operations. This would have significantly increased their greenhouse emissions, so the World Bank rushed in with carbon financing to help Plantar expand the eucalyptus plantations that provide the company's charcoal.

The impact of the expanding eucalyptus farms has been devastating to the nearby village of Sao Jose do Buriti. Concerned residents were joined by Brazilian NGOs, churches, social movements and unions to halt World Bank finance of the project in 2002 and 2003. Today residents have witnessed the water table dropping, the disappearance of biodiversity and medicinal plants, and the application of herbicides and pesticides to timber plantations that have killed local farmers' subsistence crops and poisoned streams. Perhaps more seriously, groups allege that Plantar pressured local residents to sign letters of support for the project or forfeit employment at the plantations.[42]

Over-Reliance on a Cap and Trade Program: Lessons From the Credit Crisis

To effectively address climate change, the United States needs robust domestic emissions reductions targets and policies that send the correct signals to change industry behavior and produce real emissions reductions. The implementation of a cap and trade program is viewed by many as a way to use the market to achieve these reductions, but over-reliance on a cap and trade program to solve climate change raises a number of concerns, particularly in terms of the monitoring, evaluation, and verification of carbon credits in a global market.

Our Nation is currently facing an historic financial crisis that can provide us with a cautionary tale about a cap and trade program. The subprime mortgage crisis, which underpins the current banking and investment crisis, emerged from a failure of market checks and balances.

Banks bundled together high-risk and lower-risk mortgages into packages that were then bought, re-bundled and re-sold many times over. This created bundles of promised revenues that were increasingly difficult to track. When it became clear that a significant portion of the loans were bad, the whole system began to unravel, affecting everyone in the banking and investment system connected to these bundled mortgages, including average Americans with savings accounts and retirement savings, and turning a subprime mortgage problem into a systemwide credit crisis.

Unfortunately, the Federal cap and trade proposals put forth so far would create a system that poses almost identical challenges as those in the breakdown of the mortgage-lending industry:

Could emissions reductions lead to subprime carbon assets?

The subprime mortgage crisis was generated by questionable loans. A cap and trade program could face similar questions in terms of emissions reductions associated with carbon offset credits, which are likely to be tradable on open carbon markets. For offset projects to work, they need to result in a decrease in the amount of carbon pollution emitted. For example, retrofitting an industrial plant to be more energy efficient, or replacing an aging coal-fired power plant with wind power, creates GHG reductions that can be measured with relative accuracy and verified, thus resulting in legitimate credits. But not all offset projects clearly lead to emission reductions.

Some of the most visible carbon offset scandals to date have centered around international offset credits, including forest-related carbon reduction schemes, where trees have been planted to store carbon, only to die a few years later; the construction of large, environmentally destructive dams, where builders who were going to construct the dams anyway claimed "new" emissions reductions; and HFC (a chemical byproduct of refrigerant production) destruction projects, where factories purposely created these very potent greenhouse gas chemicals just so they could destroy them and make money off of the credits.

In particular, proving the "additionality" of offset projects, arguing that project would be impossible to do without the additional revenues provided by carbon credits, is very difficult. (Offset projects must prove that they are additional in order to be issued credits by the Kyoto Protocol's Clean Development Mechanism.) But according to a recent study of international offsets by leading researchers at Stanford

[42] Redman, Janet. "World Bank: Climate Profiteer," Institute for Policy Studies. April 2008.

University, "offset schemes are unable to determine reliably whether credits are issued for activities that would have happened anyway."[43]

As carbon traders develop derivatives products, which are based on promises to deliver carbon credits at a future date for a specified price, a real risk of "subprime carbon" (carbon assets that fail to deliver, called "junk carbon" by traders) emerges. Given the potentially huge size of the carbon trading market, and the increasing complexity of carbon derivatives, the risk of subprime carbon contagion is a real possibility, particularly if the current credit crisis fails to spur fundamental regulation of the financial market.

Could an onset of unscrupulous intermediaries be avoided?

The subprime crisis was exacerbated by the proliferation of mortgage brokers and other middlemen who provided questionable, if not unscrupulous, services. In the past decade, the seemingly limitless appetite for mortgage lending and mortgage-backed securities fueled a dangerous deterioration in lending standards. Since carbon is predicted to "be the world's biggest commodity market, and it could be the world's biggest market overall,"[44] a speculative carbon bubble could similarly spur the development of subprime carbon assets.

Like mortgage brokers approving "ninja loans" (loans to borrowers with no income, job, or assets), unscrupulous intermediaries may overpromise on offset projects by selling future credits based on projects that do not yet exist, are not additional, or which simply do not deliver the promised GHG reductions. If the Wall Street financiers continue employing the "originate and distribute" strategy (in which banks offload their risks to investors in the secondary markets), banks and intermediaries will still pursue lucrative fee-based business with little regard to the risks they are passing onto investors.

Can asset valuation be properly determined?

"Innovative" financial engineering characterized the credit crisis, where complex financial instruments were created that made it very difficult to determine the actual value of assets. Credit rating agencies, which were supposed to be providing rigorous assessments of mortgage-backed securities, could not analyze thousands of individual mortgages, and thus relied on financial models, which were ultimately flawed.

As secondary carbon markets grow, spawning the creation of new derivatives and structured products, rating agencies and analysts will face similar asset valuation challenges. Analyzing the quality of underlying carbon offset projects will be as, if not more, difficult than analyzing mortgages, and may be even less suited to modeling.

Will conflicts of interest be prevented?

After the Enron accounting scandal of 2001 some new regulations were issued to reduce conflicts of interest. For example, today accounting firms have separated their auditing and consulting functions, and in June 2008 the Securities and Exchange Commission issued new rules to reduce conflicts of interest among credit ratings agencies. However, conflicts of interest still exist, both in the broader financial sector and in the carbon finance market.

For example, similar to how credit rating agencies helped design complex structured finance products and rated them, consulting firms which offer advice on developing carbon offset projects may also earn fees for verifying emissions reductions from projects. Banks which own equity stakes in carbon offset projects may also be carbon brokers or sector analysts, creating a temptation to bid up carbon prices to increase the value of their own carbon assets. Such conflicts of interest compromise the integrity of the carbon markets, from both a financial and environmental perspective.

The Need for U.S. Leadership in Negotiating an International Climate Deal

The policies pursued by the United States will be critical to solving the greatest challenge facing the world today—global climate change. Global warming is an issue that will have serious impacts not only on the environment, but also on global economies, poverty and the pursuit of sustainable development as laid out in the

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[43] Wara, Michael W. and Victor, David G. "A Realistic Policy on International Carbon Offsets." Program on Energy and Sustainable Development, Working Paper #74: April 2008. http://iis-b.stanford.edu/pubs/22157/WP74_final_final.pdf.

[44] Kanter, James, "Carbon trading: Where greed is green," International Herald Tribune, 20 June 2007.

U.N. Millennium Development Goals (MDGs).[45] The costs of establishing a program to reduce and reverse global warming pollution now will pale in comparison to the cost of not aggressively addressing the problem.

A global effort to address climate change will require a fundamental transformation of our economies and with jurisdiction over U.S. trade policies and international commerce, the House Ways and Means Committee will be an integral player to the development of policies that will either promote or hamper proactive international engagement on global warming. With greater responsibility for global warming and greater capacity to address the problem, the United States can show great leadership by offering assistance to developing countries to both deal with climate change impacts and reverse the causes of global warming.

Around the world, climate change is already impacting the daily lives of the world's most vulnerable people. Facing more intense storms, drought, disruption of water and food supplies, and increased rates of disease, impoverished communities bear a disproportionate burden of these impacts, despite the fact that they are the least responsible for creating them and the least able to cope with the effects. Global warming is likely to exacerbate international competition and conflict over water and other natural resources, and result in displaced peoples, mass migrations and increased poverty—particularly in the Global South. Moreover, with the potential for the conflict generated by climate impacts, it is in the national interest of the United States to assist developing countries with the climate crisis.

For an effective global deal to be reached, the United States will need to offer assistance to developing countries to adapt to climate change and cut their GHG emissions. To avoid catastrophic climate impacts, developing countries will need to utilize clean technologies, including leapfrogging to cleaner energy sources and ensure the protection of standing forests. But developing countries, which are less historically responsible for climate change and which often have smaller budgets and larger populations than developed countries, cannot afford by themselves the costs of transforming to clean energy economies without compromising the provision of basic services, such as water, sanitation, and basic education.

Developing countries are already taking many steps on their own to both address climate impacts and to shift to cleaner energy. The United States can support these efforts and secure a global deal by being proactive in aggressively reducing its GHG emissions and by offering financing and technology transfer opportunities to developing countries for adaptation needs, clean energy, and forest protection.

The Principle of Common But Differentiated Responsibilities

Signed and ratified by 192 countries, the Convention on Climate Change set an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. According to the Convention, enacted in 1994, party governments "gather and share information on greenhouse gas emissions, national policies and best practices, launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries, and cooperate in preparing for adaptation to the impacts of climate change."[46]

The principle of common but differentiated responsibilities and respective capacities is a fundamental principle underpinning the UNFCCC, to which the United States is a party. It is also an underlying principle that underpins the international negotiations on a global climate deal already underway with an agreement expected to be reached in December 2009. This principle acknowledges differences in historic emissions, economic capacity to act, and the right to sustainable development. As a party to the UNFCCC, under the principle of common but differentiated responsibilities, the United States is obligated to reduce its GHG emissions, and provide financial support to developing countries to adapt to climate change impacts, receive transfers of clean technology, and to reduce their GHG emissions.[47]

The United States and other industrialized countries are historically responsible for global warming at greater levels than other countries. For example, G8 countries, which represent 13.5 percent of the global population, are historically responsible for over 62 percent of the greenhouse gases currently in the atmosphere. These countries, which include the United States, continue to emit some 39 percent of today's global warming pollution.[48] Per capita emissions in specific countries also demonstrate varying levels of responsibility. For example, in 2000, each person in

[45] For more on MDGs, see: http://www.un.org/millenniumgoals/.

[46] http://unfccc.int/essential_background/convention/items/2627.php.

[47] Article 4 Commitments of the UNFCCC. http://unfccc.int/essential_background/convention/background/items/1362.php.

[48] WWF International, Position Paper, "G8 Summit 2008 in Japan," June 2008.

the United States emitted 15.2 times as much carbon as each person in India and 34.7 times as each person in Malawi.[49]

Different countries likewise have differing abilities of economic capacity to respond to global warming. In 2004, the gross domestic product (GDP) per capita in the U.S. was $36,451; in India, $2,851; and in Malawi, $591.[50] Based on this measurement, the average person in the U.S. has 12.7 times as much economic output as a person in India and 61.6 times that of a person in Malawi. In aggregate, the U.S. has a much greater capacity to respond to global warming than most other countries in the world.

This combination of responsibility and capacity means that the United States has more of an obligation and is more able to help developing countries both adapt to climate change and reduce emissions. This is an understood piece of the international negotiations under the UNFCCC. The United States could promote a global deal by offering financing and technology transfer for adaptation and mitigation efforts in developing countries by using "carrots" rather than "sticks."

Mitigation Actions *in Exchange for* Technology Transfer and Financing

Currently under the UNFCCC negotiations, nationally appropriate mitigation actions on the part of non-Annex I (developing) countries are contingent on the provision of financial resources, technology transfer, and capacity by Annex I (industrialized) countries. For obvious reasons, the first priority of developing, non-Annex I countries is sustainable development. In this spirit, the United States is expected to offer financing in the key areas of adaptation (the ability of a country to respond to and build resilience to the impacts of global warming), the transfer of renewable energy technologies that build the capacity in-country to develop in a low-carbon fashion, and funding for forest protection as part of the U.S. commitment in exchange for nationally appropriate developing country climate mitigation efforts.

Funding from the U.S. for international climate activities should be made through multilateral mechanisms under the UNFCCC for adaptation, clean technology, and forests. Making contributions to these mechanisms would be a show of good faith on the part of the U.S. and would facilitate international cooperation. Contribution to these funds will also strengthen international negotiations. Qualification of countries for financing and clean technology transfer should follow decisions made under the UNFCCC.

Transfer of Clean Technology to Developing Countries

It is in the interest of all countries to have developing countries leapfrog dirty energy sources on their path to development and move directly toward clean energy economies that allow for both economic growth and increased energy access. Developing countries need assistance in transitioning to clean energy pathways so that governments will not have to choose between low-carbon renewable energy and poverty alleviation. For a global deal to be reached, the United States will need to make commitments both within U.S. policy and under the UN climate convention to finance transfers of clean technologies to developing countries.

The World Bank estimates that the incremental costs to deploy clean energy technologies in just the power sectors of developing countries would require $30 billion annually.[51]

The G77 and China (representing 130 developing countries) have explicitly supported a multilateral technology financing mechanism under the authority of the UNFCCC. The establishment of a financing mechanism for technology under the UNFCCC—both for mitigation and adaptation—was a major focus at UN climate change talks in Bonn, Germany in early June 2008, with a number of governments putting forward proposals. Under Article 4.3 of the UNFCCC, developed countries are obliged to provide finance and technology to developing countries to meet their full incremental costs of taking action to address climate change. Article 4.7 says that developing countries' actions depend on the extent to which developed countries meet their technology and finance commitments. The G77 and China reiterated in Bonn that any funds by developed countries outside the UNFCCC cannot be counted as meeting their commitments. This, in turn, means the United States and other industrialized countries cannot hold developing countries to their qualified obligations to reduce GHG emissions. It also means that should U.S. funds be directed

[49] Figures for greenhouse gas emissions come from the World Resources Institute's Climate Analysis Indicators Tool, http://cait.wri.org/.

[50] Ibid.

[51] "A World of Difference in Energy Access," World Bank Group, May 9, 2007. http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:21328449~menuPK:34457~pagePK:34370~piPK:34424~theSitePK:4607,00.html.

to mechanisms outside the UNFCCC, the U.S. would then have to make additional, parallel contributions to the UNFCCC to meet its own obligations.

Developing countries, including China and India, were unambiguous in Bonn that they do not see the World Bank's Climate Investment Funds as a good faith effort or as a show of international good will. Many in the Global South see the establishment of the World Bank's Climate Investment Funds as a donor-driven process that lacks meaningful consultation and undermines the UN process.

Further, a strong definition of clean, renewable energy is essential to ensure that it is both renewable and effective in reducing GHG emissions. The World Bank does not define what it means by clean energy. Friends of the Earth supports a definition of international clean technology that includes renewable energy, such as wind, solar photovoltaic, solar thermal, sustainably-sourced biomass, up to 10 MW hydropower, wave, tidal and geothermal. Clean and renewable energy technologies do not include those perpetuate GHG emissions, such as coal (including the unproven techniques of carbon capture and sequestration of coal plants), oil, natural gas, and unconventional fossil fuels such as tar sands, oil shale, and coal-to-liquids; hydropower over 10 MW; and those that produce fissile materials, such as plutonium-239 or uranium-233, in the course of their operation.

Scarce, public clean energy funding should be used to drive down the price of renewable energy to make it cost-competitive with artificially cheap coal and further, to provide clean energy to the 1.6 billion impoverished people in the world who still lack access to electricity. Modern coal technologies do not need public assistance—they are already fundable through private investment, with improved energy efficiencies paying for themselves in short time periods.

There is also a serious opportunity cost presented by investing scarce climate funding toward technologies that have not been proven to work or will not come on line in the near future, such as carbon capture and storage (CCS). Using funds for CCS-readiness (as the World Bank CTF document describes) would be counterproductive, as it would lock in high emission coal plants in the hope of future mitigation that may never be achieved, or may be achieved after catastrophic climate change has already occurred.

To re-engage with the international community, generate good will, and be effective in combating climate change, Congress should proactively support an International Clean Technology Fund under the authority of the UNFCCC. This presents the United States with an important opportunity—after long delay—to show real leadership in the global effort to address climate change and help break the impasse of mistrust and finger pointing at international climate negotiations.

International Adaptation to Global Warming Impacts

As the IPCC has made clear, the world's poorest people—those least responsible for the climate crisis—will be hurt the most by the immediate and long-term impacts of global warming. For example, the IPCC finds that up to 250 million people in Africa are projected to be exposed to an increase in water stress due to climate change, and in some countries, yields from rain-fed agriculture could be reduced by up to 50 percent by 2020. As the IPCC notes, "this would further adversely affect food security and exacerbate malnutrition." As a result of these and other climate impacts, climate change will be one of the central drivers of global poverty in the 21st century.

The UN Development Program (UNDP) estimates that $86 billion a year by 2015 will be necessary globally to meet adaptation needs.[52] The United States and other wealthy countries have the ability to help developing countries finance adaptation, which would allow them to continue to combat poverty while at the same time addressing climate change. The United States is responsible for nearly a quarter of the pollution that causes global warming, with 23 percent of cumulative global emissions from the consumption of fossil fuels for the period of 1990 to 2005. These metrics alone suggest that the United States could be responsible for between 20 and 40 percent of the global funding necessary to address international adaptation, or between 23 and 40 percent of the $86 billion UNDP says is needed.

Several international funds have been created under the United Nations Framework Convention on Climate Change (UNFCCC) to address adaptation needs:

The Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF) are already administering funding for adaptation-related projects, although they are significantly under-funded. LDCF funds have been used to support the development and implementation of national adaptation programs of action (NAPAs), which have been completed by 32 countries and are underway in a num-

[52] United Nations Human Development Report, 2007/2008, http://hdr.undp.org/en/reports/global/hdr2007-2008/.

ber of others. The NAPAs, which are designed to build upon existing coping strategies at the grassroots level and emphasize community-level input, provide a framework for least developed countries to identify, prioritize, and address adaptation needs.[53]

The Adaptation Fund, which was operationalized at the UNFCCC negotiations in late 2007, is likely to be the primary fund for adaptation moving forward. The governance and structure of the fund are improved over previous funds. For example, the Adaptation Fund Board includes majority representation from recipient governments. The Adaptation Fund will receive 2 percent of proceeds from international trading of carbon emissions under the clean development mechanism, although the Fund will also require additional sources of funding to be effective.[54]

Any domestic or international delivery mechanisms of climate assistance must ensure transparency, accountability, and community participation to effectively deliver adaptation funds and be seen as credibly contributing to a global climate negotiation. To do this, such funds should be transmitted via a UNFCCC-established fund.

International Trade

In putting a price on carbon, concerns have arisen in the United States about the potential impact of increased cost on U.S. manufacturing sectors. Imposing a carbon tariff, or border tax adjustment, on GHG-intensive goods was first proposed by Europe as a means to entice the United States to join an international agreement. It has now gained currency in the United States primarily as a mechanism to address concerns about China's growing emissions. Imposing special measures on imports from countries has been pitched as an appropriate means to level the playing field for U.S. industries competing with countries that are not participating in an international climate agreement or not undertaking adequate climate change mitigation measures.

The use of border tax adjustments (BTAs) must be evaluated based on their overall effectiveness, their role in reducing emissions internationally, as well as their ability to protect U.S. consumers and businesses. However, there are questions raised around the three main objectives that BTAs are to satisfy: (1) prevent a potential decline in output from U.S. manufacturers facing higher cost from new domestic climate mitigation policies; (2) prevent the displacement of U.S. manufacturing to new locales where GHG intensity of production is allowed to be higher, resulting in increased emissions; and (3) incentivize participation in a multilateral climate mitigation agreement for those countries hoping to gain or maintain market share in the United States.

The largest share of carbon-intensive imports into the United States originates in Canada, followed by Europe. In comparison, China's share is comparatively small. Because Canada and Europe, as well as many developing countries, are on average cleaner than U.S. production, then implementing BTAs could likely put U.S. manufacturing at a competitive disadvantage, and thus fail to meet their primary objective.

Advocates for imposing a carbon tariff on carbon intensive goods at the border claim that it will force developing countries to the bargaining table. It must be restated however that China, the source of much of the concern in the U.S. climate policy debate, is productively engaged in multilateral negotiations under the UNFCCC to achieve a global deal on climate. China is also already taking aggressive action to curb emissions, including a renewable energy standard and a reduction in national energy intensity. Such progress in China should damper arguments that U.S. industry will move there to avoid carbon regulation. Further, because Chinese exports to the U.S. make up such a small fraction of Chinese production, BTAs are unlikely to function as useful leverage in compelling China to take on binding emissions targets.

Given the clear international momentum building up toward the UNFCCC Conference of the Parties (COP)15 in Copenhagen, scheduled for December 2009, all efforts should be focused on reaching an ambitious global agreement that tackles the climate crisis in both an effective and fair manner to both U.S. consumers and the international community. International cooperation is the best route for progressively eliminating environmental and climate dumping and a "race to the bottom" in environmental standards and regulations. Bold leadership by the United States is welcomed and encouraged by the international community and may be the single best "carrot" to entice other countries to join a robust and effective multilateral agreement under the UNFCCC.

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[53] http://unfccc.int/adaptation/napas/items/2679.php.

[54] http://unfccc.int/cooperation__and__support/financial__mechanism/items/3659.php.

RECOMMENDATIONS

Decarbonize the Tax Code—Remove and redirect subsidies that encourage wasteful energy use and the use and production of fossil fuels. Friends of the Earth finds that at least $32.2 billion could be freed up through a decarbonization of the Tax Code that could be applied to activities that encourage the efficient use and production of clean energy.

Protect American Families—Adopt policy options that provide (1) a sufficient amount of resources is designated specifically for low- and moderate-income households, (2) rebates or similar income recycling is delivered fairly and through effective delivery mechanisms, and (3) additional investments focus on revitalizing lower-income communities toward decreasing carbon dependence and increasing job opportunities. This should be accomplished while avoiding cash grants to investor-owned Local Distribution Companies (LDCs).

Consideration of a Cap and Trade Program—Economists agree that any consideration of a Federal cap and trade program should start with an adherence to auctioning all the pollution permits rather than give them away for free. A cap and trade program need not be the only approach used to reduce GHG emissions. Complementary policies outside a carbon trading program can be better mechanisms to capture emissions from some sources, such as transportation or international deforestation. International offset projects present special problems under a cap and trade program, particularly with forests, and should be avoided.

Approach Cap and Trade Program with Caution and Prudence—The current credit crisis in the United States provides a cautionary tale to heavy reliance on a carbon trading system. The design of California's global warming law, AB32, may provide a model of sorts, as California is likely to rely on carbon trading for only one-forth of its overall emissions reductions.

Support Bold U.S. Leadership to Reach An Effective Global Climate Deal—The United States needs to offer substantial financial and technical assistance to developing countries in the areas of international adaptation and clean technology transfer before developing countries are forced to commit to reducing their GHG emissions.

Statement of Stephen A. Smith

My name is Stephen Smith. I am the Executive Director of the Southern Alliance for Clean Energy (SACE). Since 1985, SACE has been working on behalf of citizens in the Southeast to promote responsible energy choices that create global warming solutions and ensure clean, safe and healthy communities throughout the Southeast.

SACE applauds the work you have done to promote effective climate change legislation and pledges to work with you and your staff to ensure the bill ultimately adopted by Congress embraces the most effective and responsible approach to reducing greenhouse gas emissions.

In this testimony, I would like to focus on one particular and critical aspect of a well-designed cap and trade program for carbon emissions—the need to auction 100 percent of the credits immediately. As this testimony will demonstrate, auctioning all the credits is a critical predicate to ensuring the environmental, economic and political success of a carbon cap and trade program.

Unprecedented Resources at Stake

The science of pollution mitigation has advanced significantly since Congress enacted the first cap and trade program to address the problem of acid rain back in 1990.

In the 18 years that followed, study after economic study lends critical support to the idea that a properly constructed cap and trade program must auction 100 percent of the carbon credits. Anything less than 100 percent auctions would needlessly increase the cost of the program to the economy and consumers, while potentially resulting in windfall profits for shareholders and executives of electric utility companies and other industries.

Under a cap and trade program, a carbon credit authorizes the holder to emit one metric ton of carbon dioxide, or its equivalent, per year. These credits will be extremely valuable—eventually generating hundreds of billions of dollars in revenue each year—and they represent an important resource in our Nation's efforts to address global warming.

As CBO Director Orszag testified in April 2008 before the Senate Finance Committee:

On the basis of a review of the existing literature and the range of CO_2 policies now being debated, CBO estimated that by 2020, the value of those allowances could total between $50 billion and $300 billion annually (in 2006 dollars). The actual value would depend on various factors, including the stringency of the cap (which would need to grow tighter over the years to keep CO_2 from continuing to accumulate), the possibility of offsetting CO_2 emissions though carbon sequestration or international allowance trading, and other features of the specific policy that was selected. On April 10, 2008, CBO estimated that the value of the allowances created under S. 2191 (America's Climate Security Act) would be roughly $145 billion once the proposed program took effect in 2012; in subsequent years, the aggregate value of the allowances would be even greater.

The cumulative value of these credits over the life of the program is simply unprecedented and any decision on the allocation of these resources should be made only after extensive examination of their potential utility. Properly structured, these revenues could be used to help families with their energy bills and to speed the development of important renewable energy and energy efficiency technologies.

Many of the leading climate change bills before Congress, however, would give a majority of the carbon credits away. For example, the legislation the Senate considered earlier this summer—America's Climate Security Act—would auction just 26.5 percent of the credits at the start of the program. Many of the remaining 73.5 percent of the credits would be allocated for free to industries with a history of emitting greenhouse gases. Later in the program's lifetime, this legislation would still allocate more than a quarter of the credits for free. Other major climate change bills in Congress allocate credits in a similar fashion.

We caution the Committee from adopting this approach. It will needlessly increase the economic cost of reducing our greenhouse gas emissions and undermine the ability of future Congresses to assist low-income families and other vulnerable communities.

No Windfalls for Polluting Industries

Utilities and other greenhouse gas emitting industries argue that Congress should allocate some or all of the credits to them for free to minimize the energy costs they pass on to their ratepayers. For example, in testimony before the Senate Environment and Public Works Committee on June 28, 2007, Jim Rogers, the Chairman of Duke Energy,[1] stated:

> Consumers should not be penalized for fuel choices that were made 40-plus years ago. Areas of the country facing the largest increases in electricity rates due to climate change policy also represent the Nation's industrial heartland. How allowances are allocated will directly impact the cost of electricity and the prices these consumers pay.

This argument is simply inaccurate. Gifting billions of dollars in pollution credits to utilities will not lower energy bills for ratepayers because the marginal cost of abating a unit of greenhouse gas is the same regardless of whether a firm buys the permits or is allocated the permit for free. As the Congressional Budget Office observed in their testimony before the Senate Energy and Natural Resources Committee in May:

> By attaching a cost to CO_2 emissions, a cap and trade program would thus lead to price increases for energy and energy-intensive goods and services. Such price increases would stem from the restriction on emissions and would occur regardless of whether the government sold emission allowances or gave them away. Indeed, the price increases would be essential to the success of a cap and trade program because they would be the most important mechanism through which businesses and households were encouraged to make investments and change their behavior to reduce CO_2 emissions.

Further, the CBO notes:

> Giving all or most of the allowances to energy producers to offset the potential losses of investors in those industries—as was done in the cap and trade program for sulfur dioxide emissions—would also exacerbate the regressivity of the price increases. On average, the value of the CO_2 allowances that producers received would more than compensate them for any decline in profits caused by a drop in demand for energy and energy-intensive goods and services. As a result, the companies that received allowances could experience windfall profits.

[1] Warned makes it sound like what he's saying needs to be heeded; far from it.

Harvard Economist Greg Mankiw accurately points out that freely allocating carbon credits to polluting industries is nothing more than corporate welfare.

To understand why this is the case, consider a utility that is given credits equal to its historic level of carbon emissions, as many utilities have suggested should happen. How will that allocation affect the utility's behavior? Very little, as it turns out.

If the utility has a history of emitting 100 tons of carbon dioxide or equivalent per year and is given 100 credits that can be used to emit one ton of carbon each, the utility considers options for reducing its carbon emissions and determines that the cost of reducing its emissions from 100 to 99 tons is $10. If each credit is worth $15 dollars, then the utility will spend the $10 to reduce its carbon emissions by one ton, sell the credit, making its shareholders $5 in the transaction. The utility will continue to reduce its emissions and sell its credits until the cost of reducing another ton of carbon emissions is equal to the market value of the credit. If the cost of reducing emissions from 60 to 59 tons is equal to $15, then the utility will stop there. In the end, it uses 60 credits and sells 40.

Now consider the case where the utility is given zero credits, and has to buy them in order to continue operations. Once again, the utility will have to balance the cost of credits verses the cost of reducing its carbon emissions. In this case, the utility will buy credits until the $15 cost of buying a credit is equal to the cost of reducing the next ton of carbon emissions. Here, the utility buys 60 credits, and invests in mitigation technologies to reduce the other 40 tons of carbon.

The important point here is that the firm's behavior is the same regardless of whether it is given the credits or it has to buy them like everybody else. In both cases, the utility produces the same amount of electricity as well as carbon. And ratepayers will face similar costs.

What About Costs to Industry?

In recent years, considerable research has gone into assessing what level of credit allocation is necessary to "compensate" the owners of utilities and other industries for losses associated with a carbon cap and trade program. One study found that allocating between 9 and 21 percent of the credits under the Kyoto Protocol would be sufficient to offset the agreement's costs to energy and electricity producers.

Other studies, however, found the regulatory regime of a cap and trade program without auctions could increase the opportunity for profits by affected industries. As Resources for the Future noted in a 2002 study:

> By compelling fossil fuel suppliers to restrict their outputs, the government effectively causes firms to behave like a cartel, leading to higher prices and the potential for excess profit. To the extent that the environmental policy enables firms to retain these rents—such is the case under CO_2 policy involving freely offered tradable permits—the firms can make considerably higher profit under regulation than in its absence.

Wall Street apparently agrees. The Wall Street investment firm of Bernstein Research reported earlier this year its analysis of the potential impact of a cap and trade program on utility industry financials. The title of the report—"U.S. Utilities: Unregulated Generators' Profits Could Surge Under Senate Bills to Cap CO_2 Emissions"—reflects its findings that implementing a cap and trade program could increase profits for some utilities. As the report notes:

> If the U.S., in implementing its own cap and trade regime for GHG emissions, also allocates allowances for free, we can expect unregulated power generators in this country to behave similarly, passing through the value of allowances consumed to wholesale power prices. And as these generators will bear no offsetting cost, their earnings can be expected to increase materially.

Whatever the costs or benefits to industry, the more pertinent question to ask is simply this: If a cap and trade program affects everyone—energy consumers and producers alike—why should polluting industries alone get compensated?

Global warming affects everyone. No industry should be given special status and protected from the responsibilities that the rest of us will face.

Economic Efficiency and Low-Income Families

Effectively addressing climate change will impose a certain level of costs on the economy. The question before Congress is how to best structure a cap and trade program to minimize the impact to the economy while helping low-income families and other energy consumers most vulnerable to changes in energy prices. The answer to this question, again, is to auction the credits and use the revenues raised to reduce the program's overall cost to the economy.

The CBO estimated that giving away credits under a cap and trade program would cost nearly twice as much than if the credits were auctioned and the revenues used to cut taxes. Who would bear the additional costs of giving away credits to polluting industries?

Of the four allowance-allocation and revenue recycling scenarios that CBO analyzed, the share of policy costs borne by households in the lowest-income quintile would be largest if the government gave allowances away and used the revenue received . . . to reduce corporate taxes.

Further, the CBO noted in their June 17th letter to Senate Energy and Natural Resources Committee Chairman Bingaman that lawmakers have several options for assisting those most effected by increased energy costs, including collecting the resources from the auction of carbon credits and issuing rebate checks to households across the United States. The CBO noted that:

> Lawmakers could choose to offset the price increases experienced by low- and moderate-income households by providing for the sale of some or all of the CO_2 emission allowances and using a portion of the revenues to compensate such households. For example, the Congressional Budget Office (CBO) found that lower-income households could be financially better off as a result of a cap and trade program (compared with no program—and without consideration of any benefit in terms of reduced risk of damage from climate change) if the government chose to sell the allowances and used the revenues to pay an equal lump-sum rebate to each household in the United States. In that case, the size of the rebate would be larger than the average increase in low-income households' spending on energy-intensive goods.

Different studies may suggest different optimal options, but they are universal in finding that the free allocation of credits to industry produces the worst outcome, both for the economy as a whole and for at-risk populations. Freely allocating credits needlessly surrenders resources that could be used to ensure the best outcome for the economy and low-income families.

Auction, Not Allocation

Congress should auction all credits under a cap and trade program and use those resources to assist ratepayers with their energy costs while investing in the development of critical technologies necessary to speed the future reduction of greenhouse gas emissions.

Such an approach represents the surest means of meeting emission targets in the most equitable and economically efficient manner. Anything less is simply corporate welfare to those industries that have contributed the most to climate change.

I thank the Committee for holding this hearing and for advocating solutions to global warming. SACE looks forward to working with the Committee to produce the most effective climate change legislation possible. Southern Alliance for Clean Energy (SACE) is a nonprofit, nonpartisan organization that promotes responsible energy choices that create global warming solutions and ensure clean, safe and healthy communities throughout the Southeast.

Since 1985 SACE has been working on behalf of citizens in the Southeast to provide independent analysis of the energy supply system in the region, help State utility commissions evaluate proposed energy projects, work with State and local governments to develop new programs to improve the energy efficiency of government facilities and vehicles, and support the siting and development of clean, renewable energy sources in our region.

SACE has been a leading voice for energy reform protecting our communities and our region's natural resources for more than 20 years with offices and staff throughout the Southeast.

Dear Congressman Doggett,

On behalf of our organizations, we write to applaud your efforts to build support for strong congressional action to address global warming.

Your commitment to science-based emissions reduction targets, auctioning allowances, addressing global warming's impacts on natural resources, and advancing an international global climate deal by funding international adaptation for at-risk countries is essential. We look forward to working with you to ensure that a climate bill will serve as the economic engine to repower America by investing in clean energy research and development and energy efficiency, creating green-collar jobs, and saving millions of dollars for American families.

We appreciate the leadership and debate you are inspiring with the introduction of the Climate MATTERS Act. Interest in the bill encouraged the House Ways and

Means Committee to hold a well-attended, robust hearing this month and as such deepened the Committee's investigation into policy options to solve global warming. Our groups recognize that the House Ways and Means Committee, with its unique areas of jurisdiction, will play an important role in helping our Nation to achieve strong, science-based reduction targets through the Tax Code and other means, while also ensuring that American families and workers are adequately protected from undue hardship.

Thanks to your efforts to educate your colleagues, nearly 100 Members have already shown that they fundamentally agree that our Nation needs long-term solutions to our energy problem and that those solutions go hand in hand with solving global warming.

Sincerely,

Andrew Fahlund,
Vice President for Conservation, American Rivers

Sarah Saylor,
Legislative Representative, Earthjustice

Emily Figdor,
Federal Global Warming Program Director, Environment America

Shawnee Hoover,
Legislative Director, Friends of the Earth

Kate Smolski,
Sr. Legislative Coordinator, Global Warming Campaign Greenpeace

Justin Tatham,
Assistant Director of Government Relations, National Audubon Society

Bob Gruenig,
Senior Policy Analyst, National Tribal Environmental Council

David Waskow,
Climate Change Program Director, Oxfam America

Will Callaway,
Legislative Director, Physicians for Social Responsibility

Dave Hamilton,
Director of the Climate and Energy Program, Sierra Club

Jennifer S. Rennicks,
Federal Policy Director, Southern Alliance for Clean Energy

David Moulton,
Federal Global Warming Program Director, The Wilderness Society

Lexi Shultz,
Deputy Director, Climate Program, Union of Concerned Scientists

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Statement of Thomas J. Gibson

On behalf of the members of the American Iron and Steel Institute, it is my pleasure to submit to you our written testimony in response to the hearing the Committee recently held entitled "Policy Options to Prevent Climate Change."

We believe the most important principle for successfully addressing climate change is this: It is a global problem that can only be addressed effectively on a global basis. If your Committee is guided by this principle, we are confident any resulting legislation will have two desirable outcomes: It will actually lower CO_2 emissions globally and it will do so without lessening the competitiveness of U.S. manufacturers in the global marketplace.

The steel industry in the U.S. has the lowest energy consumption per ton of production and the lowest CO_2 emissions per ton of production in the world. Production of steel in the U.S. versus other parts of the world is therefore good for the environment.

The enactment of any CO_2 reduction legislation in the United States that does not incorporate or provide for similar measures being taken by other major steel producing nations such as China, on a contemporary timeline, will alter our competitiveness verses global steelmakers. We must hold foreign manufacturers to comparable standards, or else we will risk our own manufacturing jobs and economic health, while at the same time making our planet's atmosphere worse, not better.

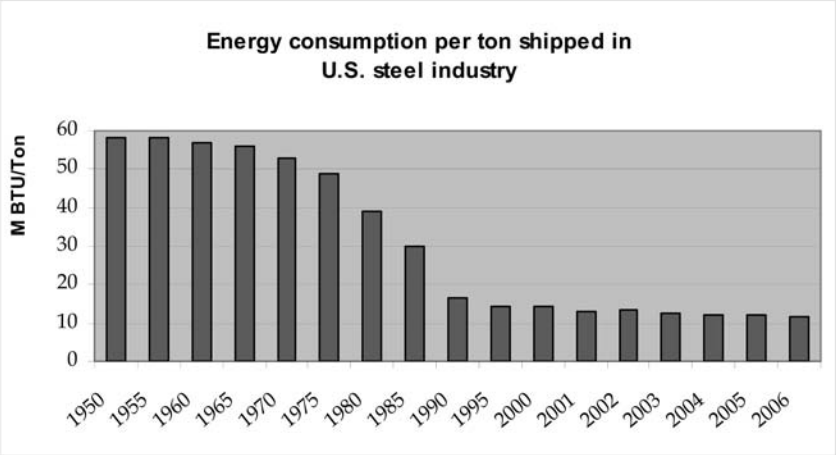
There are many activities proceeding in parallel with your deliberations that all address in some way a "global solution to a global problem." We offer the following two points for your consideration.

- The steel industry worldwide is working on a Global Steel Sectoral Approach to climate change under the auspices of the International Iron and Steel Institute. It is an agreement that will obligate major steel producers, including those in Brazil, Russia, India and China, to reduce CO_2 emissions. It is the type of agreement that has the potential to lower global CO_2 emissions without creating market distortions. It is being presented to UNFCCC negotiators in Poland in December 2009 as a model for post-Kyoto policy. We believe governments should look to the Global Steel Sectoral Approach to inform their own public policy initiatives.
- In the absence of a successful Global Steel Sectoral Approach that avoids distortions in the marketplace, legislators must be prepared to address competitiveness impacts as an essential component of domestic climate change policies. For example, prior legislative efforts have included various "competitiveness provisions." We believe that any competitiveness provision should impose the same cost obligations on imports that are imposed on domestic producers, for example by border adjustment measures; by requiring foreign and domestic firms to begin buying allowances in the same timeframe; by subjecting imports to the same requirement to obtain and submit allowances for greenhouse gas emissions; and by eliminating the Administration's discretion to waive the requirements on foreign manufacturers.

Our overarching point remains: Climate change is a global problem that can only be addressed effectively on a global basis. We urge Congress to ensure any climate legislation involves our major trading partners so that it will lower CO_2 emissions globally without lessening the competitiveness of U.S. manufacturers in the global marketplace.

Background—Steel Industry Leadership

The American steel industry is part of the solution in this debate, not the problem. We are the most energy efficient steel industry in the world and we have the data to prove it. We not only beat the Kyoto targets 11 years early, we are already accomplishing on our own what the various cap and trade proposals seek to do for the entire economy. The domestic industry, largely through recycling and investments in new technology, has reduced energy use per ton of steel shipped by over 40% over the past 25 years. Specifically, reductions in energy intensity per ton of steel shipped between 1990 and 2006 exceeded 29% (a detailed chart appears below).



Because of our advances over the last two decades, the state-of-the-art processes and technologies we operate today are highly optimized. This means that in order to continue to make reductions in energy use, new technologies and new processes are required. We are currently researching, in collaboration with the rest of the global steel industry, the next generation of iron and steelmaking technologies that will drastically reduce or eliminate CO_2 emissions. Such new "breakthrough tech-

nologies" will be developed and deployed over the next 15–20 years and any legislated CO_2 reduction timeline should recognize when these technologies will be commercially available.

The steel industry has and is developing new types of steel products that lead the way in reducing the greenhouse gas emissions of our customers, for example, through the design of automobiles using advanced high strength steels which permit much lower vehicle weights and require much less fuel, all while maintaining vehicle safety. Use of certain steel products results in more efficient buildings and infrastructure and is integral in pressure vessels for electrical power generation and energy transportation. Fighting global warming will require significant amounts of new steel products.

Background—Energy Supply

The cost of energy is sure to rise, not just for steel, but for the entire economy. Unfortunately, lack of a coherent energy policy has not been addressed in any of the current pending climate legislation. We need increased energy supply and greener energy, both of which have immediate benefits in reducing the CO_2 footprint of all manufacturers. Obviously, if U.S. energy costs continue upwards unabated, this will only increase the likelihood that foreign manufacturers, who have access to affordable energy, will capture U.S. jobs and domestic market share, and consequently increase greenhouse gas emissions.

Background—Cap and Trade

We still have grave doubts generally about how well cap and trade can address climate change. Cap and trade worked reasonably well on the acid rain problem. The climate change issue is quite different. With climate change we have major technological gaps, the need for global reach, the presence of foreign competitors and no guaranteed ability for regulatory cost pass-through.

Congress has under consideration a number of proposals to address climate change through a cap and trade regime. While the competitiveness provisions contained within these bills are well intentioned, much work remains in order to craft proposals that actually will result in addressing the global issue of climate change and meet WTO muster. Adopting a competitiveness provision that proves to be ineffective or WTO-illegal, will fail to create a level playing field and result in a significant loss of high-paying and highly valued jobs.

Thank you for your time and consideration. We recognize the enormous challenge that faces the Committee as it seeks to develop responsible climate change legislation. Please be assured as the Committee moves forward it will have the full cooperation of our industry as a technical resource to be called on at any time. We look forward to working with you on this critical issue.

Statement of VPSI

Climate Change Legislation—"A three legged stool"

Much of the debate and discussion regarding climate change legislation has focused on how to develop a 'cap and trade' system which would create caps on the amount of carbon that can be emitted in the air, while establishing a market for industry to buy and sell the right to emit carbon. While potentially effective, a 'cap and trade' system would only have a direct impact on stationary source emissions. Mobile source emissions, primarily emissions from personal and freight transport, would widely be unaffected by a cap and trade system.

Transportation sources accounted for approximately 29 percent of total U.S. greenhouse gas emissions in 2006. Transportation is also the fastest-growing source of U.S. GHGs, accounting for 47 percent of the net increase in total U.S. emissions since 1990 and is also the largest end-use source of CO_2, which is the most prevalent greenhouse gas.[1]

Climate change legislation designed to only manage stationary source emissions through a cap and trade system would be incomplete. In order to deal with the issue of climate change, VPSI urges Congress to pass comprehensive global warming legislation which attacks the problem by reducing both mobile and stationary source emissions.

Specifically, a comprehensive global warming legislative package should include:

- A Cap and Trade scheme;

[1] Greenhouse Gas Emissions from the U.S. Transportation Sector 1990–2003; U.S. EPA, 2006.

- Clean fuels legislation; and
- Cost effective polices and programs to promote a reduction in vehicle miles traveled (VMT).

While understanding that this Committee does not deal with every aspect of the legislation, for the purpose of this hearing, VPSI will highlight some of the items that this Committee can include in a global warming package.

Furthermore, VMT reduction will not only help reduce carbon emissions, but it also reduces congestion, and helps conserve fuel. So as this Committee acts on other important pieces of legislation, VPSI would kindly remind the Committee that many of these initiatives can, and should, be passed as soon as possible. We'd like to begin by briefly introducing VPSI and vanpooling.

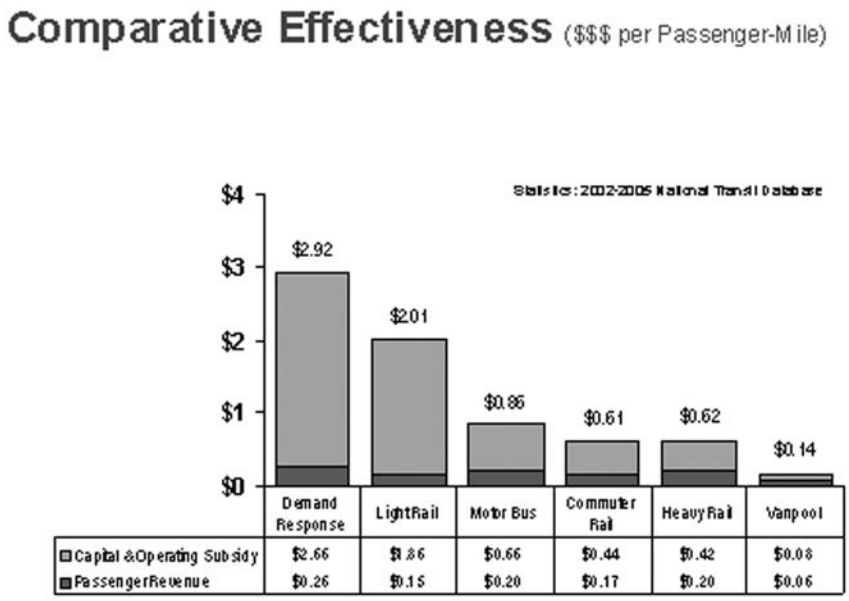
Vanpooling and VPSI—Background

VPSI is the Nation's largest vanpool service provider with nearly 5,000 vanpools serving commuters in more than sixty (60) metropolitan areas and three (3) statewide programs (Hawaii, Michigan and Vermont). VPSI vanpools remove ~1.8 million tons of carbon each day[2] from the atmosphere, leading to a reduction of ~457 million tons of carbon each year[3] (see calculations below). Nationally, there are ~12,000 vanpools removing ~1.1 billion tons of carbon each year.[4]

What is a vanpool? In short, a vanpool is simply a large carpool. Generally speaking, a vanpool is created when 6–15 people who typically work at the same company or common location will decide to commute together. This group will pick one person to be the volunteer driver and one-to-three alternate drivers. This group will then contract for the use of a nine to fifteen passenger vehicle on a "30-day, pay-as-you-go" basis through a vanpool service provider.

VPSI and other vanpool providers work with large employers, transportation management associations, metropolitan planning organizations, and other public entities to market and organize vanpools.

Figure 1—Vanpooling Is the Most Cost Effective Mode of Public Transportation



[2] Calculation: (50K cars × 50 miles/day ÷ 22 mpg × 19.4 tons CO_2) − (5K vanpools × 50 mi/day ÷ 13 mpg × 19.4 tons CO_2) = ~1.8 million tons CO_2 reduced.

[3] Calculation: ~1.8 million tons CO_2 reduced × 250 workdays per year = ~457 million tons CO_2 reduced.

[4] Calculation: (120K cars × 50 mi/day ÷ 22 mpg × 19.4 tons CO_2 × 250 workdays/yr) − (12K vanpools × 50 mi/day ÷ 13 mpg × 19.4 tons CO_2 × 250 workdays/yr) = ~1.1 billion tons CO_2 reduced.

Vanpooling is not exclusive to large metropolitan areas, in fact, much of the growth vanpooling has experienced over the past several years has occurred in small metropolitan areas and in rural markets where commuters often travel more than 50 miles each day to get to and from their work location.

As Congress works to put together climate change legislation, VPSI urges Congress to include provisions which would lead to a reduction in vehicle miles traveled.

VPSI calls upon Congress to take the following actions as a part of comprehensive climate change legislation:

- Reinstate the Vanpool Investment Tax Credit.
- Include the tax provisions included in the Transportation and Housing Choices for Gas Price Relief Act of 2008 (H.R. 6495).
- Set-aside cap and trade proceeds for transit, vanpooling, and other VMT reducing strategies.
- Include legislative provisions creating equity between the parking and transit benefits associated with section 132(f) (H.R. 1475), and establish a tax credit for employers who subsidize their employees alternative commutes (H.R. 6030).

These legislative remedies are not a silver bullet, but should be one part of the overall solution. Additionally, it should be noted that beyond a reduction in carbon emissions, VMT reductions also help conserve energy and reduce congestion. As such, VPSI would urge Congress to pass these provisions if another appropriate opportunity presents itself.

Reinstate the Vanpool Investment Tax Credit

Under the Federal Energy Tax Act of 1978, a 10 percent investment tax credit was approved for employers who established vanpools. To qualify for the credit, the van was required to have a seating capacity of at least eight, excluding the driver, have a 3-year useful life, be used 80 percent of the time for vanpooling, and be put into service by January 1, 1986.

From 1975 to 1985 over 24,000 commuter vanpools were placed into service. Large employers, e.g. 3M, Conoco, Texaco, Pennzoil, Arco, Hartford Insurance, Schering Plough, Boeing, Aramco, Arizona Public Service, TVA, Chrysler, Cargill, Northrop, Shell, Ford, and McDonnell Douglas, acquired fleets of vans to transport their employees to and from work.

The vanpool investment tax credit expired in 1986 and was not extended. VPSI urges Congress to reinstate the 10% ITC, but also include private vanpool service companies in eligibility. (They didn't exist from 1978 to 1985, except in 5 or 6 urban areas. Now these private vanpool service companies serve commuters in more than 60 U.S. cities).

Based upon historical trends and increasing demand, VPSI projects that if such legislative policy was enacted, vanpool use could double over the next four (4) years. Such growth would lead to new emission reductions of ~1.1 billion tons of carbon per year at an estimated total cost of $36 million over the 4-year period, or ~$122/ton of carbon. (See Table 1).

Additionally, a reinstated 10% vanpool investment tax credit would be three times more effective at reducing CO_2 emissions, would reduce peak hour VMT in commute traffic by a factor of 10, and would have less than half the impact to the Treasury than the current tax credit for the purchase of hybrid vehicles. (See Figure 2).

Table 1—Cost to U.S. Budget of Investment Tax Credit FY '10–FY '13

Target = 24,000 vanpools	Typical large commuter van = $30,000
Current fleet = ~12,000	Value of 10% ITC = $3,000
Growth = ~12,000 vanpools	**Impact on Treasury = $36,000,000 ($3,000 × 12,000)**

Figure 2—Cost to U.S. Treasury Hybrid *vs.* Vanpool ITC

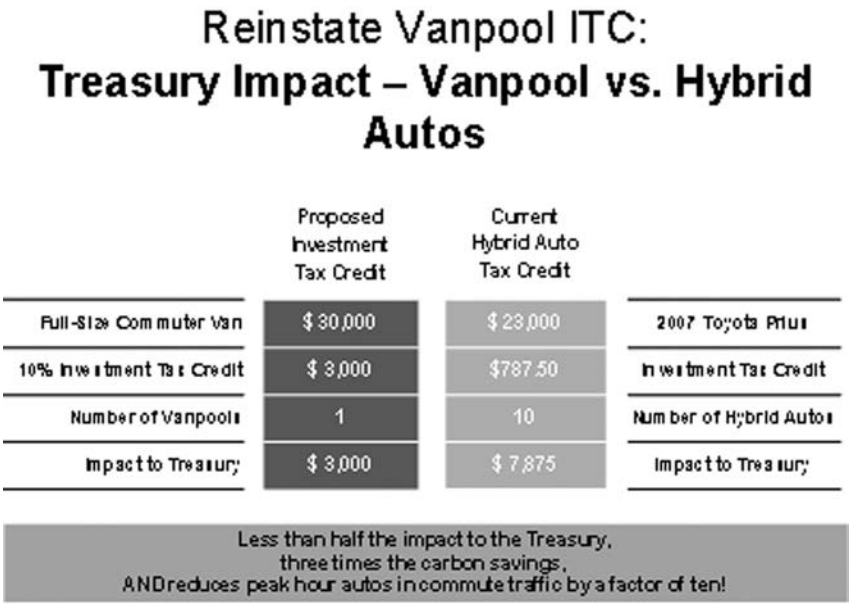
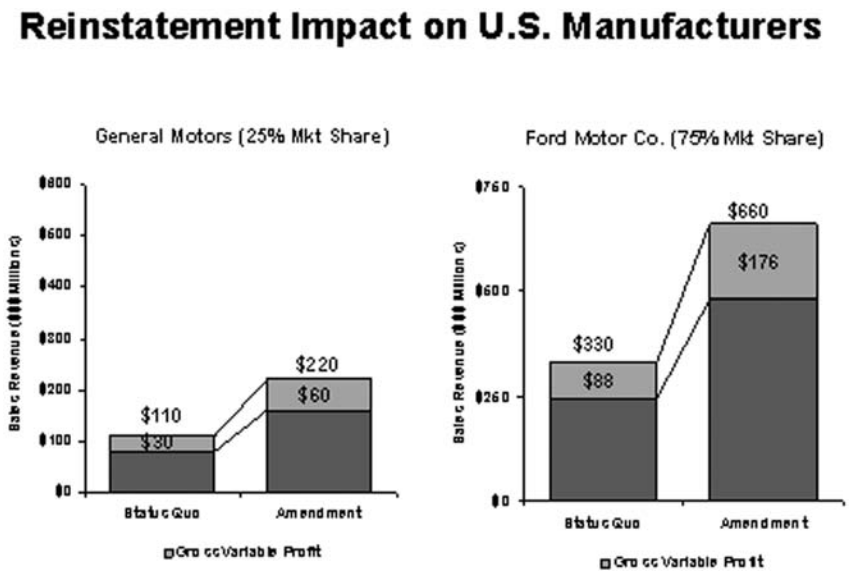


Figure 3—Impact of ITC Reinstatement on Domestic Automakers



Finally, an investment tax credit is also good for domestic automakers. Vanpools typically use nine (9) to fifteen (15) passenger vehicles. Currently, only domestic automakers produce these larger passenger vehicles. The proposed policy change would mean an additional $440 million in sales for domestic automakers over the next 4 years. (See Table 4).

Include the tax provisions included in the Transportation and Housing Choices for Gas Price Relief Act of 2008 (H.R. 6495)

The Transportation and Housing Choices for Gas Price Relief Act of 2008 (H.R. 6495), as introduced by Congressman Blumenauer (D–OR) is a comprehensive piece of legislation aimed at providing commuters with options from the high price of gas. While the direct focus of this legislation is relief from the pain at the pump, a secondary focus is to reduce the amount of greenhouse gases that are emitted into the air. VPSI urges the Ways and Means Committee to act on the relevant sections of this legislation that affect the Tax Code and are under this Committee's jurisdictions. Specifically:

- Section 7 'Credit for Teleworking'—which would provide a tax credit of up to $400 a year for qualified teleworking expenses.
- Section 8 'Transportation Fringe Benefit to Bicycle Commuters'—which would expand the transportation fringe benefit under section 132(f) of the Code to those who commute to work via bicycle. The provision sets a cap of $50/month.
- Section 9 'Increased Uniform Dollar Limitation for All Types of Fringe Benefits'—which would create parity between the parking and transit portions of the transportation fringe benefit.
- Section 11 'Eligibility of Self-Employed Individuals to Receive Certain Transit Benefits'—which would allow the self employed to take advantage of the transit benefit under section 132(f) of the Tax Code.
- Section 12 'Parking Cash-Out Programs'—which would require any employer who subsidizes or offers pre-tax parking benefits to also offer parking cash-out programs. Parking cash-out is a term used when employers offer employees cash in lieu of parking to encourage employees to use transit or other forms of transportation.
- Section 13 'Vanpool Credit'—which would reinstitute a tax credit as described earlier in our testimony.

These legislative proposals are cost effective measures that will encourage more Americans to utilize alternative forms of transportation, thus driving less and emitting less carbon into the atmosphere.

Set-aside cap and trade proceeds for transit, vanpooling, and other VMT reducing strategies

According to the Environmental Protection Agency nearly one-third of all greenhouse gas emissions come from the transportation sector. As Congress puts together a cap and trade system, VPSI strongly recommends that no less then 10% of the funds generated from the cap and trade system be dedicated to mass transit and VMT reducing strategies. VPSI recommends that when putting together the details of such a program that it recognizes all the stakeholders who play a role in transportation and can play a role in reducing VMT including employers, local and regional planning bodies, transportation management associations, and private providers of public transportation. Funneling resources to existing Federal Highway and Federal Transit formulas alone may not inspire the type of change that is required to meet the goals of this legislation. VPSI recommends that the funding be apportioned in a way that guarantees it is used in an efficient way to reduce VMT and carbon emissions.

Additionally, provided that a cap and trade program would not produce proceeds for several years, VPSI recommends that the legislation include provisions that would allow public and private transportation agencies to bond against the promise of cap and trade proceeds in order to begin early action programs.

Include legislative provisions creating equity between the parking and transit benefits associated with section 132(f) (H.R. 1475), and establish a tax credit for employers who subsidize their employees alternative commutes (H.R. 6030)

Finally, comprehensive climate change legislation should include provisions that increases transit ridership nationwide. There are two ways that this can be accomplished. First, the Ways and Means Committee should include legislation offered by Congressman McGovern (D–MA) which would establish parity between the parking and transit portions of the transportation fringe benefit. This would end the current financial incentive to drive to work that exists in the Tax Code. Additionally, including this provision would mean that those Americans with the longest commutes, and thus are driving the most and emitting the most carbon during their daily commute would now be covered by the transit benefit and would have an incentive to stop driving to work. One version of the legislation offered by Congressman McGovern would increase the cap on the transit benefit from $115/month to $200/month while

slightly reducing the parking portion from $220/month to $200/month. In this version, the legislation is revenue positive by $143 million over 10 years.[5]

Secondly, this Committee should include legislation offered by Congressman Kirk (R–IL), H.R. 6030, which would create a tax credit for employers who subsidize their employees' commutes. Multiple studies have shown that when an employer pays for their employees' commute as a part of their benefit package, transit ridership and use of alternative transportation modes increases dramatically. More and more American businesses recognize the role they can play in the fight against global warming. As a part of that fight, employers are ready and willing to become more involved in their employees commutes. As such, the Federal Government can help inspire more companies to become engaged by offering a small tax credit. The cost of such credit would be minimal compared to the outcomes.

Conclusion

The recommendations outlined here today are only a few of the many legislative remedies that can help reduce carbon emissions, and fight global warming. VPSI recommends this Committee and the whole of Congress study all of these remedies and include anything and everything that can have a positive benefit.

If you have any questions, please contact Jon Martz, Vice President of Government Affairs at (248) 597–3519 or Jason Pavluchuk at (202) 285–6414. We look forward to working with this Committee as the process unfolds.

[5] According to a Joint Committee on Taxation letter to Congressman McGovern, June 19th, 2007.