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March 5, 1998**

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HOLDS HEARING ON THE KYOTO CLIMATE TREATY
~~March 05, 1998~~

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HOUSE SCIENCE COMMITTEE HOLDS HEARING ON THE KYOTO AGREEMENT

MARCH 5, 1998

SPEAKERS: U.S. REPRESENTATIVE JIM SENSENBRENNER (R-WI), CHAIRMAN
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U.S. REPRESENTATIVE ELLEN TAUSCHER (D-CA)

STUART EIZENSTAT, UNDERSECRETARY OF STATE FOR ECONOMIC,
BUSINESS AND AGRICULTURAL AFFAIRS

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SENSENBRENNER: The committee will be in order. Before we get to Secretary Eizenstat, there is one bit of housekeeping business relative to the election of ranking Democratic members to the floor subcommittees of this committee.

Pursuant to notice, I call up the issue of a motion to approve the election of ranking Democratic members and recognize the gentleman from Indiana, Mr. Roemer, for a unanimous consent request.

ROEMER: I thank the gentleman, the chairman from Wisconsin. And Mr. Chairman, the departure of Representative Bud Cramer from the committee has left a vacancy in the ranking Democratic member position on the Space and Aeronautics Subcommittee.

After notice, the Democratic Caucus of the Science Committee met on February 4, 1998, and approved the following members to serve as ranking Democratic members for the remainder of this Congress: the honorable Bart Gordon, ranking Democratic member, Subcommittee on Space and Aeronautics, the honorable Tim Roemer, ranking Democratic member, Subcommittee on Energy and Environment, the honorable Jim Barcia, ranking Democratic member, Subcommittee on Technology, the honorable Eddie Bernice Johnson, ranking Democratic member, Subcommittee on Basic Research.

Mr. Chairman, by direction of the Democratic Caucus, I move the adoption of the above election of the ranking democratic members.

SENSENBRENNER: Without objection. The elections, as stated by the gentleman from Indiana are approved, and a motion to reconsider is laid upon the table.

This marks the Science Committee's third hearing on the Kyoto Protocol, the UN treaty that would mandate the United States to cut its greenhouse gas emissions by seven percent below 1990 levels by the years 2008 to 2012. Today we turn our focus on the State Department.

As I said at the committee's opening hearing on February 4, I believe the Kyoto Protocol to be seriously flawed, and so flawed, in fact, that it cannot be salvaged. This treaty is based upon immature science, costs too much, leaves too many procedural questions unanswered, is grossly unfair because developing countries are not required to participate and will do nothing to solve the speculative problem it is intended to solve. And I have heard nothing to date that would persuade me otherwise.

So let me briefly recap what I consider the highlights of what we've heard so far. At our first hearing on February 4, Dr. Jay Hakes, the administrator of the Energy Information Administration, testified that the Kyoto Protocol would require the U.S. to cut carbon emissions by some 550 million metric tons, or 31 percent below the levels expected in 2008 to 2012.

And in a refreshing burst of candor, Dr. Haiks said it is unlikely the adjustments can be achieved without a significant price mechanism, and that under most scenarios, the price mechanism selected would slow somewhat the rate of economic growth. Or translated into plain English, he said the only way we can meet the emissions reduction targets mandated in the treaty is through a significant increase in energy prices, and that this will hurt our economy.

At our second hearing on February 12, we considered the administration's fiscal year 1999 budget request that are directly related to the Kyoto process, including the administration's proposed climate change technology initiative.

This initiative, a five-year package, which includes \$2.7 billion for research and technology and \$3.6 billion for tax credits to reduce U.S. greenhouse gas emissions, represents a spending increase of about \$473 million, or nearly 58 percent for all agencies, with the bulk of that increase going to the Departments of Energy and the Environmental Protection Agency.

I came away from this hearing with three major concerns about the initiative. First, the research and technology portion is light on funding for research in generic technology development, and heavy on funding for commercialization activities that are more appropriately the business of the private sector.

Second, the tax credits further complicate an already unmanageably complex tax code. And third, funding for the initiative is included as a part of the administration's research fund for America, whose funding relies on uncertain tax increases, that unsettled tobacco deal, and unspecified program reductions.

Finally, I want to comment on the tenor of the testimony we have had from most administration witnesses. Instead of making reasoned and factual arguments for its case for the protocol that are based on sound and transparent analyses, administration after administration witness has repeated sky-is-falling speculations about the potentially negative impacts of the climate change, speculations that are apparently designed to alarm the American public and to demonize the opposition.

And looking at the charts to my left, it kind of looks that way today as well. This is particularly ironic when analysis after analysis, including one by Professor Bert Bolin, chairman emeritus of the IPCC, in the January 16, 1998, issue of "Science" magazine, shows that the protocol will have little or not impact on the buildup of greenhouse gases in the atmosphere or in the environment.

The administration's tactics remind me of the adage that I learned in law school about arguing the case. "If the facts are with you, you pound the facts. If the law is with you, you pound the law. And if neither the facts nor the law are with you, you pound the law." It appears to me that the administration is doing a lot of law pounding and very little fact pounding.

That being said, I am pleased to welcome as our sole witness today, the honorable Stuart E. Eizenstat, undersecretary of State for Economic, Business and Agricultural Affairs.

Mr. Eizenstat headed the U.S. negotiating team at Kyoto. And those of us who were there marveled at his stamina and endurance in participating in marathon negotiating sessions to the extent that we even gave him our bus to get there early one day.

It appears from his schedule that Mr. Eizenstat is trying to top that feat. The hearing is his third on Kyoto this week and his second today.

I do want to acknowledge that Mr. Eizenstat had requested that he be accompanied by Ms. Janet Yellen, chair of the Council of Economic Advisers, to present the administration's economic analysis of the protocol. We readily accepted that request with the caveat that Mr. Eizenstat and Ms. Yellen appear on a panel of outside witnesses, which could provide comments on the administration's economic analysis.

Mr. Eizenstat's office stated a preference that we -- that he appear alone. And we have honored that request.

I can assure that the committee will take up the administration's economic analysis at a later date and have Ms. Yellen as the lead-off

ess.

So, Mr. Eizenstat, I welcome the opportunity to hear you pound the facts today. And I look forward to a vigorous exchange of views on the protocol and yield to the gentleman from Indiana, Mr. Roemer, for an opening statement.

ROEMER: I thank the chairman. And first of all, I'd ask unanimous consent that Mr. Brown's entire statement be entered into the record.

SENSENBRENNER: Without object. The request is granted. And without objection, all members will be allowed to insert opening statements in the record at this point.

ROEMER: I thank the chairman. And my records -- my recorded comments here will be very brief.

First of all, I want to welcome Stuart Eizenstat before the committee. He is a very gifted and talented public servant that served President Carter as chief domestic policy adviser in the White House and did a superb job there. He is now serving President Clinton, and in exemplary fashion.

He's got a tough job working on the Kyoto accord in this issue that he is telling our committee about today. I would applaud the administration for particularly the positions that they took in very innovative and creative and bold ways going into Kyoto. I thought the administration took a very good approach in terms of presenting our arguments with some very new ideas.

I'm hopeful -- and if anybody can do it, Stuart Eizenstat can do it -- is to continue to try to move back to those positions in Kyoto and try to get some of these developing countries involved in this treaty.

With that, I want to again come back to my admiration for Mr. Eizenstat for the job he's done in the past, for the job he is doing now, for the job he will do in the future. He is a friend of mine. He is a friend of my family's. And it is with great pride that we welcome you today before the committee.

SENSENBRENNER: And I certainly also want to welcome you. And I do associate myself with the remarks of Mr. Roemer about your talents, Mr. Eizenstat, even though we may have somewhat of a disagreement on this issue.

Before asking you to proceed without objection, the chair has granted authority to recess the committee during votes this afternoon. Mr. Eizenstat, without objection, your full statement will be placed in the record at this point. We would like to ask you to summarize your statement in five to eight minutes or so. That way, we can get you out of here by your announced departure time at 2:00 p.m., and all of us can get back to our districts then, too.

So, Mr. Eizenstat, please proceed as you will.

EIZENSTAT: Let me start by thanking Congressman Roemer and yourself for your kind remarks and thanking you personally, Mr. Chairman, for the enormous amount of time and effort you've put into going to Kyoto, your interest and involvement. And I think that although I understand your position, we certainly had an excellent communication and a regular communication. And I appreciate it very much, you and your colleagues' participation.

I'd like to discuss four things. First, the science, and to do so in non-hyperbolic terms. Second, the key features of the protocol. Third, to correct some misperceptions. And fourth, to review the president's own Climate Change Technology Initiative.

First, of the science. There is, I think now, a fairly clear scientific consensus that human beings are indeed changing the climate by increasing the global concentrations of greenhouse gases. Over the last century, greenhouse gases have been released to the atmosphere far faster than natural processes can remove them. And here, there is really no ambiguity in the data.

The first chart to my extreme right shows actual data taken from core samples by scientists. The orange data is data that has been taken since 1957, continual measurements of atmospheric CO2 concentrations by scientists at an observatory in Hawaii.

And they indicate quite dramatically and clearly that the concentrations of greenhouse gases have grown by some 30 percent, and particularly since 1960. You can see the increasing slope of these concentrations in the orange from 1960 to the present. That slope will continue and increase dramatically.

Records of past climate going back as far as 160,000 years indicate a close correlation between concentrations of greenhouse gases and global temperature changes. Computer simulations of the climate indicate that global temperatures will rise as atmospheric concentrations of CO2 increase.

The authoritative 1995 Intergovernmental Panel on Climate Change, representing the work of more than 2,000 of the world's leading climate change scientists from more than 50 countries, represented the best synthesis of the science on climate change. They indicated that under a business-as-usual scenario, concentrations of greenhouse gases could exceed levels not seen for 50 million years. The projected temperature increases are two to six-and-a-half degrees over the next hundred years would exceed rates of change not seen for the last 10,000.

The chart that is closest to me, the second chart, indicates this clear correlation between concentrations and temperature increases. The band indicates the degree of difference in terms of how much the temperature will increase, but that it will increase seems quite clear.

Indeed, this IPCC study already found that the Earth had warmed about one degree Fahrenheit over the last century, beginning with the industrial revolution, and found that the evidence suggests that this is coming from a discernible human influence on global climate.

Increased temperatures will speed up the global water cycle, lead to a drying of soils, and in some areas increase drought. Sea levels are expected to rise between six and 37 inches over the next century.

This again, is not an attempt at scare tactics. Global mean sea level has already risen over the last hundred years four to 10 inches, mainly because water expands when heated, and because the melting of glaciers, which discernibly, measurably has occurred worldwide over the last century, contributes to this rise in sea levels.

A 20-inch sea level rise would double the global population at risk from storm surges and ~~low-lying areas in places like~~ coastal Louisiana and the Florida Everglades, as well as other parts of the world would potentially occur.

Formerly frozen soils, so-called permafrost, in the Alaska and Siberian Arctic, have also begun to melt. Again, this is measurable. This is not conjecture. This is not wild speculation. This is actual measurement. Will damage both ecosystems and infrastructure. Melting and tundra warming will lead to the decay of organic matter and the release of trapped carbon and methane, creating an additional source warming.

This will affect human health as well. It will exacerbate air quality problems and diseases that thrive in warmer climates. It's been estimated that by the end of the next century there would be an additional 50 million to 80 million cases of malaria each year if this climate change continues unabated.

And only in yesterday's "Washington Post," executives from leading oil companies -- Shell, Texaco, BP and others -- indicate that in fact there is a climate change occurring and that human conduct is having an impact. As one says, "We're moving beyond denial." And the other indicates that it's time to move beyond the scientific notion and determine what to do about it.

We look at Kyoto, Mr. Chairman and members of the committee, as an insurance policy. It's an insurance policy against potentially devastating and irreversible impacts of global warming. If we act now, the premium on this policy will be reasonable and less costly than if we delay in the hope that the problem will somehow go away.

It's a little bit like you and I deciding to wait until we're middle-aged before buying an insurance policy and finding that the premiums are obviously much more expensive than if we had purchased earlier. But in this case, we won't have a second chance. Failure to could lead to irreversible consequences, and will be committing children and grandchildren to a very different planet.

There is a lag time, Mr. Chairman and members of the committee, between the buildup of concentrations, which are again absolutely scientifically determined, and the concentration levels and consequent temperature increases. So by waiting, we allow those increases to occur until it will cost infinitely more to act if we wait.

Second is the protocol itself, Mr. Chairman and members of the committee, and this represents -- if I may respond to Congressman Roemer's point -- it is a framework for action. It's not a finished product. But it has many of the elements that the president and vice president directed us to get.

In particular, there were three that were asked for. Two were fully achieved. And the third we did not fully achieve, but we have at least a down payment.

The first of those objectives ~~was to get realistic targets and timetables among developed countries.~~ And here we got the following.

First, multi-year time frames rather than a single fixed year, as many of the other countries wanted. This will give our industries much greater flexibility in terms of the target because they don't have to hit it in one year. It can be average.

In addition, the time frame that was selected, 2008 to 2012, was, as the chairman will remember, the U.S. time frame, not the earlier periods preferred by the European Union, Japan, and others. And this will cushion the transition and give our industries and workers more time to adapt.

We also were able to get the concept of differentiated targets for key industrial powers, ranging from six to eight percent below baseline levels. So our competitors are taking on similar, and in the case of Europe, greater obligations than are we.

When changes in the accounting rules for gases and offsets for Sinks, which I'll describe in a minute, are taken into account, the level of effort required of the United States is very close to the president's original proposal of stabilization, representing at most a three percent real reduction below that proposal, and perhaps less.

We also were successful in getting in innovative proposal called Sinks. This was shaped in part by the United States to allow activities like planting trees and good forest practices, in which we excel beyond any country in the world, and which absorb carbon dioxide to be used to offset emissions requirements that industry would otherwise have to make.

In a way, it's like saying that for every tree that's planted in the United States, we can take a burden off of a particular industry in terms of meeting the targets.

We also succeeded in covering all six greenhouse gases, which was a desire not only by the environmental community, but by our industry

Well. And the European Union and Japan fought until the bitter last minute to cover only three.

Our second objective was to achieve these targets by flexible market mechanisms. Now the European Union, Japan, and others argued: No, we should have harmonized policies. That was a euphemism for top-down regulation and for carbon taxes.

We said: No, that is not the way we're going to do it. We're going to do it by flexible market mechanisms, rather than mandatory policies. And Kyoto enshrines in Article XVII a centerpiece of this U.S. market-based approach, and that is emissions trading, the opportunity for companies and countries to trade.

In this way, companies and countries can purchase less expensive emissions permits from other companies and countries that have more permits than they need. ~~This is not only environmentally sound, but~~ it makes great economic sense.

And Mr. Chairman and members of the committee, this is not a pipe dream. We already have emissions trading in the United States in our acid rain program. And it has reduced the projected costs of that program by 50 percent while meeting our environmental objectives.

So the inclusion of these market-based mechanisms -- and the right to trade in the open market was a signal victory for the United States. Indeed, one of the reasons I have to leave at 2:00 is because we're hosting a meeting with Australia, Canada, Japan, New Zealand, Russia and the Ukraine, which formed an umbrella group to talk about how we can trade more efficiently between us.

Let me be very clear. The commitment we made in Kyoto would not have been made and could not have been made were it not for the flexibility that these market-based mechanisms give us. Until we're satisfied with the rules and procedures yet to be established, the promise of Kyoto will not be realized.

Our third objective at Kyoto was to secure meaningful participation of key developing countries, obviously a concern of the Congress, of the Senate, of the House and of this committee. Obviously, global warming is a global problem by definition. It requires a global solution.

By some time around 2025, some way 2015, some say 2035, the developed world will be emitting less greenhouse gases than the developing world. And the developing world will be emitting more.

There was significant resistance in Kyoto, which I know, Mr. Chairman, you will remember very well, by some developing countries. Still, developing countries may as a prerequisite for engaging in emissions trading, a real incentive, voluntarily assume binding the targets through amendments to the annex of the protocol that lists countries with targets.

Let me be very clear and very candid. The Kyoto Protocol does not meet our requirements for developing country participation. Nevertheless, even here we made a significant down payment in the form of provision suggested by Brazil and backed strongly by the United States called the Clean Development Mechanism, which embraces our concept of a joint implementation with credits program.

Here again, we're using flexible market mechanisms. But here we're engaging the developing world. This will bring a bridge with incentives between the United States and other developed countries and developing nations, allowing our companies here or elsewhere in the developed world to invest in projects abroad -- clean power plants, forestation projects and the like -- and to get credit for it against their emissions targets, again lowering the burden on U.S. industry by allowing this kind of participation. They can either invest or they can simply purchase the permits.

Now in determining what is meaningful participation by developing countries, circumstances differ. What would be relevant for a Singapore or an Israel or a South Korea and Mexico, which are in the OECD, in the latter two cases may be very different than Bangladesh.

Third, I'd like to briefly clear up some misconceptions. The first misconception is that Kyoto somehow will imperil the ability of our military to meet its worldwide responsibilities. This is absolutely untrue.

We took special pains working with the Defense Department and our uniformed military, one of whose representatives was with me at Kyoto, to fully protect our unique position as a worldwide superpower with global military responsibilities. We achieved everything that we were asked by the Defense Department to do.

For example, at Kyoto, a decision was made to exempt key overseas military activities from any emissions targets, including exemptions for so-called bunker fuels that are used in international aviation and maritime transport by our military, and from emissions resulting from multilateral operations, including self-defense, peacekeeping and humanitarian relief.

This would exempt from our national targets not only multilateral operations expressly authorized by the UN Security Council like Desert Storm or Bosnia, but importantly, multilateral operations like Grenada that were not authorized by the Security Council, but which are consistent with the Security Council's -- with the UN Security Charter, which allows self-defense. Secretary Cohen indicated in a recent letter to the House that "the Defense Department is fully satisfied with the Kyoto results."

A second misconception is somehow the protocol will create a super-UN secretariat with intrusive verification. This is also not true. The verification largely codifies existing practices under the 1992 Rio Convention.

The review process will not be done by some UN secretariat, but by experts nominated by governments. The review teams will meet with government officials and with others only by invitation. Site visits will take place -- and I underscore this -- only if approved by the host country, including, obviously, the United States. And no one will go on private property in the United States of America unless the owner of that property expressly agrees.

So the notion that somehow people are going to be swooping down by unannounced helicopters on U.S. private property is utterly, completely, and totally false. We will not accept, nor do we anticipate, an approach which will require UN approval of individual emissions trades either.

Last, Mr. Chairman, where do we go from here? First, we have to adopt rules and procedures to assure that this emissions trading and joint implementation are operating efficiently and smoothly. I'll be working, and our team will, closely with our industry to be sure that they're satisfied that the system develop -- is developed in a way that's efficient and effective for them.

We also have to work to secure meaningful participation of key developing countries. We'll be putting on a full core diplomatic press, which has already begun, to achieve this. We will accept nothing less. And we know you will accept nothing less.

As the president has indicated, we will not assume binding obligations under the protocol on this country until key developing countries meaningfully participate in meeting the challenge of climate change.

It obviously would be premature to submit something to the Senate when the Senate itself has asked for this kind of participation and we have not yet achieved it. That's our obligation over the coming months, and if necessary, coming years.

Further, let me say that to lock in the progress we've made and that I've described with the developed countries, we anticipate signing the protocol sometime between mid-March of this year and mid-March of next year when it is open for signature. We haven't as yet determined the precise timing due to tactical considerations. We'll sign at a time which makes the most sense in terms of our diplomatic situation.

Last, Mr. Chairman, is the president's own proposed initiative. As you mentioned in your opening statement, a \$6.3-billion initiative of tax cuts and R & D incentives.

This country -- and I think your committee will be central to this -- this country has an unparalleled capacity for innovation and for developing technological solutions to problems when Jack Smith, president of General Motors, talks only a few weeks ago about the fact that he's going to produce a car that will get twice the gas mileage that our current cars will make and that he was going to be

...ucing this in several years, when Texaco talks about the fact that they're going to be producing a special conversion program for natural gas to reduce the amount of natural gas that's flared.

We know that we have the technological capacity -- and this, again, I think this committee is going to be front and center in helping us meet these obligations -- and create jobs at the same time. Indeed, when I was undersecretary of Commerce, we created a special unit on environmental exports. Environmental exports, members of the committee and Mr. Chairman, are the fastest growing exports the United States have. And these countries are going to be hungry for our exports of environmental technology, Honeywell measuring devices and the like, so that they can meet their obligations.

So I look forward to working with you, Mr. Chairman, as we did in Kyoto, with your committee, with the Congress. All I would say is this: The science is there. ~~We would risk ignoring it.~~ We can purchase an insurance policy now at a very reasonable cost. And if we ignore the signs and we assume that this problem will go away, we will wake up a decade from now and have to pay far, far greater costs than the moderate costs we can assume now.

Thank you very much for your attention.

SENSENBRENNER: Thanks very much, Mr. Eizenstat, for your very thorough testimony. We'll be operating under the five-minute rule. If a second round of questions is necessary and time permits, that will be the case.

Mr. Eizenstat, I think that it has been quite plain since Kyoto that the administration considers this whole issue a work in progress. What changes in the Kyoto Protocol are necessary, number one, in order for the president to sign this protocol, and number two, in order for, in your opinion, the Senate to achieve the two-thirds vote to ratify it?

EIZENSTAT: It is our anticipation and expectation that we will be signing the protocol sometime between the middle of March this year and next year. At the same time, we know that we have the following to do, Mr. Chairman.

First, we have got to make sure that the rules and procedures for trading allow uninhibited market mechanisms to work. We can't have artificial constraints on that trading. That trading is essential to our capacity to meet the goals in a cost-effective way.

Second, we have to launch, and we are launching a major diplomatic initiative to obtain the participation of developing countries. We know that the protocol cannot be ratified, nor indeed will we even submit it for ratification until we have that meaningful participation.

This will take months. It may take much longer.

SENSENBRENNER: Those are the two points?

EIZENSTAT: Those are the major points. There are many other features. For example, we'll be working on the rules for the clean development mechanism. There are a whole host of other items that we will obviously be trying to pass the president's own initiative on technology to jump start this. We'll be trying to develop partnerships with developing countries.

But the two major features, I would say, are developing good rules for unimpeded trading, both international trading and the Clean Development Mechanism, and trying to enlist the participation of developing countries.

SENSENBRENNER: If the administration is not successful in both of these areas, is the administration willing to walk away from this process and declare it fatally flawed?

EIZENSTAT: Well, we believe that we will be successful. With respect...

SENSENBRENNER: Well, I'm saying if you're not successful, are you willing to walk away from it and declare it fatally flawed?

EIZENSTAT: Mr. Chairman, with all deference, I'd prefer not to speculate on something hypothetical I don't believe will occur. We believe that we have to get good emissions trading. And as I've indicated in my testimony, without it, we can't achieve the objectives that we're seeking. And clearly, without meaningful participation, we won't even submit the treaty.

SENSENBRENNER: Well, Mr. Eizenstat, you know, as both of us know, having been in Kyoto, the provisions in the initial draft treaty for voluntary assession of developing countries were stricken by a floor amendment at 2:00 in the morning. And it will be up to the United States to try to get it reamended to have such a mechanism either through the amendment process outlined in Article XX or the annex process in Article XXI.

Both of them require either consensus or a two-thirds vote. Excuse me, three-quarters vote.

EIZENSTAT: Three-quarters, correct.

SENSENBRENNER: And the amendment process requires at least six months' notice before the November meeting in Buenos Aires, which means we have to say what we're proposing to amend by the end of April, which is not too far from now.

Also, the treaty itself gives a window for signature. So if there is no amendment that is adopted or an annex that is adopted to protocol by Buenos Aires or at Buenos Aires, March 15 will come and the treaty is unamended, does the administration still intend to sign it then?

EIZENSTAT: It is our expectation between now and the March, 1999 deadline that we will because we want to lock in those gains for developed countries. But that will not be a legally binding obligation of the United States of America. That will occur only when we submit for ratification. And that will be done only when we have meaningful participation by developing countries, however long that takes.

SENSENBRENNER: Again, you know, I'm not exactly clear, because the end of the window for signature by the president or whoever the president's authorized designee is ends on March 15, 1999...

EIZENSTAT: Correct.

SENSENBRENNER: ... What happens if the United States hasn't signed it by then?

EIZENSTAT: We would not be a signatory then to the protocol.

SENSENBRENNER: OK...

EIZENSTAT: It is our intention, however, that we will do so in that time frame.

SENSENBRENNER: Even if you do not succeed in achieving these two points at the Buenos Aires conference?

EIZENSTAT: Well, again, with respect to meaningful participation by developing countries, I don't think we're going to be able to achieve that by Buenos Aires. Whether we can achieve it by March of 1999 remains an open question.

With respect to trading rights, that is one of the issues that is definitely on the agenda. It is embedded already in the protocol. It's a question of simply getting the rules for it.

Meaningful participation is not, unfortunately, embedded in the protocol. But trading rights is.

SENSENBRENNER: I guess my point is is that we lost an opportunity for a mechanism for meaningful participation at 2:00 in the morning in Kyoto. And what makes anybody believe that the people who did it to us in Kyoto are going to change their mind by a three-quarters vote and agree to it in Buenos Aires?

EIZENSTAT: That's a very good question. And there's no question that we lost it. And it was a great disappointment that we lost it because this is a global problem and it requires a global solution.

I believe based on our experience with the developed countries where ideas that were not even known by then like trading rights, like ... , like joint implementation was adopted because of a heavy education program that we can do the same, and we intend to do the same with the developing countries.

The developing countries will have several incentives. First of all, it is in their interest to have sustainable economic growth. If they achieve eight, 10, 12 percent growth rates by wrecking their economy, they will realize, and they are beginning already to realize, that that will mean that their growth will not be over time sustainable.

Second, they have a financial incentive. And that is trading rights. They cannot trade unless they adopt binding emission targets. That will be a valuable right for them. It will be a way of transferring technology, and therefore, there will be an incentive for them to adopt those kinds of targets.

And third, this is a question of education. It took us a while to educate, Mr. Chairman, the developed countries. It will take us a while to develop that education for the developing countries.

SENSENBRENNER: Thank you. My time has expired. Gentleman from Indiana, Mr. Roemer.

ROEMER: Thank you, Mr. Chairman. And again, I want to welcome Mr. Eizenstat and commend him for his excellent and very thorough testimony.

You said in your testimony, Mr. Eizenstat, that you thought that the United States won on a host of different very important issues. I said that certainly we won on the differentiated targets with respect to the Europeans and the Japanese. Is that correct?

EIZENSTAT: Yes.

ROEMER: And you said that we won on the harmonized versus the flexible policies, which is the top-down approach versus the market approach?

EIZENSTAT: Yes.

ROEMER: And you said that we won in terms of some of the emissions trading as well too?

EIZENSTAT: Yes.

ROEMER: So those are some significant contributions, and...

EIZENSTAT: Plus our budget period and a flexible budget period at that so we don't have to meet our target in one year. And it was our budget period when others wanted an earlier budget period which would have put more strains on our economy.

ROEMER: Now those are all pretty significant victories, and with respect to the positions that the Japanese and the Europeans had. One of my concerns that I alluded to in my opening statement was where we fell short with developing countries. And I guess I'd like to ask you a couple of questions about that.

Is meaningful participation, does that mean that we extend the same kinds of obligations and participation to China as opposed to a Singapore or another country?

EIZENSTAT: Not necessarily. Just as we had, Congressman Roemer, differentiated targets for the developed countries, we would expect a differentiated approach for developing countries who are at very different stages of development.

What is relevant for a Singapore with a \$15,000, \$18,000-per-year-per-capita income might be very different from China or India or Bangladesh which has a couple of hundred dollar-per-capita income. And so what we're doing now is preparing a diplomatic strategy recognizing those differences but recognizing that there are really two categories of developing countries that are important.

Quite frankly, of the ~~160 countries~~, there are ~~120~~ that in terms of emissions, really don't matter that much. There are 20 or so that do matter. And they matter in one of two ways. Either they're big emitters, like China, or they very high per-capita incomes and can assume the same kinds of obligations that developed countries do.

I feel particularly strongly, for example, about countries like Mexico or South Korea that are already in -- or countries like Argentina and Brazil that are seeking to get in the OECD. This is a developed industrial nation organization. One has to meet certain standards and rules. Seems to me that if you're going to be in the industrial club, you ought to play by industrial rules.

ROEMER: Let me ask you, in terms of meaningful participation, you alluded to breaking down from 160 to -- out of the 160 developing nations, 120 or so, and then 20. Who are the key participants in developing nations? And can a treaty be -- can an agreement be arrived at without China?

EIZENSTAT: Well, for fear that I'll omit one, I don't want to start naming all 20. But I can give you categories of countries.

Countries like India and China are important because they are very large emitters. There are developed countries -- developing countries that are fast approaching developed country status like some of the Asian countries, like Singapore or Hong Kong, like Brazil or Argentina that are both, in the case of Argentina and Brazil, large emitters and have rising levels of income.

Those are the kinds of countries that we're thinking about. And if I may say so, we're not doing this just on our own. Two weeks ago, I was in London for G8 meetings to try to enlist, and I think successfully so, countries like Japan and Canada and Italy and France and Germany and the UK, in joining us in our diplomatic effort to try to get developing country participation. This will indeed be an issue at the heads of government at the G8 meeting in Birmingham in May.

ROEMER: Seems to me, Mr. Eizenstat, that all your diplomatic

...ls and talents are going to be tested here because you're trying to convince these developing countries that this is in fact they're best interest to pursue this, and you're on a steep learning curve. Are you seeing any signs of success to cajole and convince and persuade some of these countries that it is indeed in their best interest to join into this? And you said that that probably wouldn't happen after Buenos Aires.

EIZENSTAT: In some cases, yes. I would cite, for example, Argentina as an example. Mexico is another example.

In some cases, not yet. China is an example in that category.

Let me be frank. And I know that, again, Chairman Sensenbrenner saw this directly in Kyoto, as did I.

The developing countries, particularly the poorer ones, see this as some kind of developed country plot to inhibit their capacity to industrialize after we've industrialized for 100 years, and in their terms, polluted the planet. Now just as they're industrializing and dealing with their impoverished masses, here we come saying, OK, we can afford to assume these obligations. Now you have to, too.

And we understand that. What we have suggested is that they don't necessarily have to take the same approach to absolute reductions that developed countries have taken. They could, for example, take energy efficiency requirements that reduce the level of increase in greenhouse gas emissions.

They could do so in a variety of ways, by bilateral agreements, as part of the agreement, outside the agreement. This is in their interest, being more energy efficient, desubsidizing their energy so they're not subsidizing artificial energy use and then therefore in effect subsidizing greenhouse gas use.

All of these approaches, that's why we say have to be differentiated depending on the country. So again, in summary, we've made some progress with some. We have a very, in your terms, steep learning curve with others.

ROEMER: Thank you. Nice to see you, again.

EIZENSTAT: Thank you.

SENSENBRENNER: Gentleman's time has expired. The gentleman from Minnesota, Mr. Gutknecht.

GUTKNECHT: Thank you, Mr. Chairman. And first of all, Mr. Eizenstat, thank you for your years of public service to our country.

SENSENBRENNER: Would the gentleman like to continue, or would want to break now?

GUTKNECHT: Why don't I continue, and...

SENSENBRENNER: OK.

GUTKNECHT: ... some of the other members can go and vote.

SENSENBRENNER: OK. The gentleman is recognized for five minutes.

GUTKNECHT: Mr. Chairman, as you indicated, I represent Minnesota. And, you know, it's interesting because when we talk about the issue of global warming back home, most of my constituents say, "What's wrong with that?"

As you may remember, a couple of years ago, we had a situation where the winter was so cold that in some parts of Minnesota, you could literally take a glass of water, throw it out in the air, and if you're outside, it would freeze before it hit the ground. So we've enjoyed this El Nino thing. And frankly, we don't --- you know, we don't wish any harm to the people of California or other parts of the country, but a little warming would be a good thing for us.

I raise that because, first of all, I'm concerned that I think in general, we're all sort of prisoners of hope about this whole issue of global warming and CO2 and other greenhouse gases. When I look at these charts, what it seems to say to me is -- in fact, as I look at the second chart in the blue line, we really don't see a whole lot of global warming literally from about the 1990s until now, and yet how in the next several years, we're going to see that trend hard.

I'm not certain where that evidence comes from because I've asked some of the people from NOAA if there is any real hard evidence that we see global warming, especially in measurements of ocean temperatures. And they tell me that there really isn't any evidence of that at this point.

Secondly, you've used a term several times today: discernible human influence. I'm not exactly sure what that means. And maybe you could fill in the blank on that.

EIZENSTAT: Sure. The discernible human influence is a term that was used by the Intergovernmental Panel on Climate Change, the 1995 study with the 2,000 scientists from 50 countries. And by that, they mean that global warming occurs without any human conduct. I mean, it is necessary to keep our climate about 60 degrees Fahrenheit warmer than it otherwise would be.

But that what has happened, and this is why you get this accelerating curve, is that the human addition, particularly since the industrial revolution, is adding more and more -- exponentially adding more and more greenhouse gases to this very delicate balance where enough is taken out by absorption so that we have a very stable state. That's being in effect by human conduct that in that clear balance, that clear balance is being disturbed.

Now, over the last century since the industrial revolution, average surface temperatures have increased about one degree Fahrenheit. And according to the scientists in the IPCC, they estimate that because of the buildup, you get an exponential effect and that temperatures would increase by two to six-and-a-half degrees over the next hundred years. Their best guess is somewhere in the middle, about three-and-a-half degrees by 2100.

This would be the fastest change in 10,000 years. And these are done by computer simulations measuring the degree of buildup of greenhouse gases relative to temperatures.

Again, if I may just point you to the first chart, you notice the steep curve on the buildup. It is that steep curve on the buildup which leads to the steeper curve on temperature changes. Because the buildup is incurring -- is occurring faster, the temperature increase will occur faster.

The buildup is occurring faster because we keep adding so much to the environment through our own human conduct. And that's why we talk about this as an insurance policy.

Now the eleven warmest years this century have all occurred since 1980. Previously, 1999 -- 1995 had been the warmest until 1997. It is now the warmest.

EIZENSTAT: It is true that in some areas this may be a boon, or like a boon. But it will change forest practices, will change the whole development of our forests with ecosystems, it will have discernible changes on agricultural patterns. It will lead to drier soil and more precipitation. There will be very major changes will occur.

And interestingly, you mentioned that a couple of years ago, it was very cold. We will have more erratic weather patterns.

GUTKNECHT: Well, let me get back to that several years ago. Because we remember about 15 years ago, some of -- and I don't know if they're the same scientists -- we ought to get some of their names, were predicted that we would see another ice age. It seems to me that we've had scientists who have making these predictions, and, you know, it's like the economists. As long as they don't make them in writing, apparently it doesn't really matter.

But I do want to get back to one final point...

EIZENSTAT: But may I say -- may I say something on that point? The IPCC has met essentially every five years. They met in 1990. And their report in 1990 was much more equivocal than it was in 1995.

In 1995, they said that the balance of evidence suggests that there is a discernible human influence on global climate. That's the first time they had done that. So clearly, the scientific evidence is accumulating and indeed we are learning a great deal.

GUTKNECHT: Can I get back to the point about insurance policies?

SENSENBRENNER: I'm sorry. The gentleman's time has expired, and we have...

EIZENSTAT: I'm sorry. I will...

SENSENBRENNER: ... Ms. Jackson Lee waiting, so...

EIZENSTAT: ... I will...

SENSENBRENNER: ... will, I presume we'll have a second round later. Ms. Jackson Lee?

JACKSON LEE: Thank you very much. And thank you for your presence here at this hearing.

I have gleaned and heard the dynamics of that particular proceeding and negotiations at Kyoto. And I do want to thank you for your leadership. Obviously, there is a tension between the haves and the have-nots to a certain extent.

As it relates to understanding what we achieved, what we got, when I speak to constituents at home, when we try to articulate the potential problems of global warming and a variety of others, if you can tell me what we got, if you will, as Americans, and then two, with FY99 budget allocations, how you will utilize that in implementing ensuring that we are getting what we should get, that the other who have joined in with all the potential discomfort will also follow through. How will those monies be used as allotted in FY99. And I thank you very much.

And Mr. Chairman, I'd ask unanimous consent for my statement to be submitted in record.

SENSENBRENNER: Without objection. So ordered.

JACKSON LEE: Thank you.

EIZENSTAT: Thank you very much. What we got is a affordable insurance policy against a significant change in our climate which in turn would lead to increased flooding, which would lead to very increased levels of pollutants in the air, with health costs, which would lead to a drying of soil and potential damage to our agriculture, which would lead to a planet that is subject to much more erratic and dangerous weather patterns, and which will have warming trends so substantial that there is no historical precedent for it.

We achieved that at a relatively reasonable and cheap cost. But if we wait, the costs will go up, and go up very substantially.

What we would intend to do with the money that the president has tested, the R & D tax cut money and the -- and money for technology is to jump start the process of getting on the right track to correct

problem. It's developing everything from clean cars to more efficient power plants to ways in which to reduce natural gas flaring.

It will release the innovative capacities of this country and employ people at the same time in doing so. And that's really the purpose of the president's initiative.

JACKSON LEE: As an affordable insurance policy, you believe that it is enforceable? It is not a second-rate or second-class?

EIZENSTAT: It's a world-class agreement. And Janet Yellen's testimony, the chairman of Council of Economic Advisers, her estimates of cost, which I would be glad to summarize, are very, very modest. We're talking about three to five cents per gallon of -- around four to six cents per gallon of gasoline, something in that order. Electricity prices three to four percent going up by 2012 if we act.

We're talking about \$14 to \$23 per ton of carbon equivalent in terms of emission price. So this is affordable, and it's also necessary. If we wait, these buildups, which are scientifically determined -- again, this is not projections, these are actual measurements in Hawaii and taken from ice cores -- will continue to exponentially increase.

The steeper that slope in the left-hand chart, then the steeper will be the slope of the temperature rising. And therefore, the more erratic the weather patterns and the more damage will be done to our fragile environment.

JACKSON LEE: Thank you, Mr. Eizenstat. I'd appreciate a copy of that, if I don't already have that statement. I'd appreciate it very much. Thank you.

Thank you, Mr. Chairman.

SENSENBRENNER: Thank you, Ms. Jackson Lee. Ms. Morella? You have...

MORELLA: (OFF-MIKE).

SENSENBRENNER: She knocked on my door for a vote some years ago.

MORELLA: That's right exactly. I'll be back. I'll be back.

SENSENBRENNER: And I hope she got it.

MORELLA: I was going to ask you about how the trading situation is worked out. I know you have a section in your testimony on that.

EIZENSTAT: Yes, this Madame Congresswoman, is one of the key issues that we need to decide between now and the Buenos Aires convention in November. But the essence of it is that through free-market trading, as we're doing domestically with the acid rain program, companies and countries could purchase low-cost permits from

the countries or companies who are below their emissions budgets.

It is a very cost-effective way for a utility in Maryland to be able to afford to meet their burden without necessarily having perhaps to put another scrubber on.

MORELLA: I would like to also ask you to get back to us in terms of responding to a statement I have with regard to what the costs will be for each of our states, looking at Maryland as an example, that was put together by the Wharton -- by the Wharton Forecasting Association.

EIZENSTAT: Yes, we believe that Wharton did not take into account the kind of flexible market-driven mechanisms we've now achieved, trading rights and so forth, which dramatically reduce costs. And the Council of Economic Advisers, which just came out yesterday with this study, not even including the \$20 billion in savings we get from electricity restructuring which would mitigate the full increase in cost of this, which is very modest to begin with, would translate into an increase in energy prices between 2008 and 2012 at the household level of three to five percent.

That's 15 years from now. An increase in fuel prices of about five to nine percent, gasoline prices of three to four percent, which would be about four to six cents a gallon, electricity prices of three to four percent.

The average household's energy bill would increase by the year 2012 between \$70 and \$100. That's in line, by the way, with the kinds of regular increases we're getting in energy prices anyway. And if you take the restructuring from the proposal on electricity that we have before the Congress, that would fully offset those costs.

MORELLA: If I could also get you, you know, to respond at some later date in terms of how you would measure specifically what the statement is on Maryland, I'd appreciate it. I've got to go vote.

EIZENSTAT: Sure. Thank you very much.

MORELLA: Thank you for being here.

RIVERS: Thank you, Mr. Chair. Mr. Secretary, I have a couple of questions that really refer back to a previous hearing that we've had. And they all deal with the whole issue of national sovereignty and our rights and responsibilities under any ultimate treaty.

I'm interested in particular, there was an argument made by a witness for the Global Climate Coalition that suggested that any additional agreements to this treaty would be made as decisions of the parties to the convention and could be passed and enforced upon the United States without our agreement and Senate review. Is that true?

EIZENSTAT: Well, let me explain the amendment process. First, protocol itself strictly speaking can't be amended before it enters into force, although it is possible that the conference of

ies could adopt a supplementary protocol which would be an integral part of Kyoto.

Second, after entry into force of the protocol, it could be amended pursuant, as the chairman indicated, to Article XX of the protocol. Under that, the parties would try to adopt the amendment by consensus, but failing that could do so by only a three-quarters vote.

Once adopted, however, it would not bind a party until it ratifies the amendment. So we have a substantial number of protections.

RIVERS: So in fact, that we -- it could not be -- any changes could not be enforced upon us without our agreement to those and review of the Senate?

EIZENSTAT: Exactly.

RIVERS: OK. The further question I have on that is again this argument that the Kyoto Protocol essentially causes the United States to cede its powers to the United States, or the United Nations in order to control our economic growth and our foreign policy. What role does United Nations have relative to our own economic growth, our foreign policy relative to this treaty?

EIZENSTAT: It's very important to indicate, and this is why I missed it even in my brief summary, that this does not give the UN Secretariat or some UN body control over our economic future. We determine the rules for trading. Trading will be done under a free market system.

Verification is done by intergovernmental groups that are already operating and have been since 1992. They've met with Congressional staff. They can't do any verification or inspection in the United States without being invited to do so by the U.S. government. They can't come onto private property unless the property owner approves of that investigation.

So we don't have a situation here where you have some all-powerful secretariat that can command and control our economy. Quite the contrary. That's why we insisted on flexible market-driven mechanisms to achieve these results.

RIVERS: OK. And to follow up on that, I would also like to hear your comments on how, if at all, this agreement would impact on our ability as a nation to carry out any military mission or protect our national security?

EIZENSTAT: The military issue is one that was one of our greatest goals, and if I may say so, one of our greatest achievements. We were able to exempt overseas military activities from emissions cuts. We were able to exempt so-called bunker fuels, which our military relies on. We were able to exempt multilateral operations that are expressly authorized by the UN Security Council. And we were

to exempt multilateral operations like Grenada that are only done pursuant to the charter but not expressly authorized.

So we really met the objectives our military had. I had a very excellent relationship in Kyoto with the uniformed military who had representatives on our negotiating team. And as Secretary Cohen said in a February 24 letter -- and I'm quoting -- "Based on achieving our international objectives, the department is fully satisfied with the Kyoto results."

RIVERS: Lastly, if we fail to meet our required targets, if we agree to this treaty ultimately in whatever form it takes, and we fail to meet our required targets, what happens? And who does it?

EIZENSTAT: That's a very good question. At this point, there is only the following sanction. Countries that fail to meet their targets cannot participate in joint implementation with credit type projects.

We had also hoped to get in even stronger sanctions. For example, that you couldn't do emissions trading -- international emissions trading. That was not accepted. But it was accepted that if you don't meet your targets that you cannot participate in the clean development mechanism, which is the joint implementation with credits.

RIVERS: OK. Thank you. Thank you, Mr. Eizenstat. Thank you, Chair.

SENSENBRENNER: The gentleman's -- gentlewoman's time has expired. Gentleman from Maryland, Mr. Bartlett.

BARTLETT: Mr. Chairman, if you'll indicate when my time has expired, (OFF-MIKE)...

SENSENBRENNER: You'll hear a little beep.

BARTLETT: ... time for a second round. And I will continue my questioning at the second round if I have not finished. Thank you very much.

Let me return, Mr. Eizenstat, to the science part of it. You have demonstrated in your charts an approximate correlation between CO2 and temperature, although I note that between 1825 and 1850 while CO2 is static is going up, temperatures are falling. So that would appear not to be a really positive correlation.

But even, sir, if there is a positive correlation, how do we determine cause and effect? Two things that are positively correlated could both be the effect of another cause or either one could cause -- could be the cause and the effect. Why isn't it reasonable to assume increasing temperatures would increase life activity? There will be a balance between animals which produce CO2 and plants which use CO2, and you could therefore postulate that with rising earth

temperatures, you would have either an increase or a decrease in CO2 depending upon the relationship between animals and plants?

So I'm not sure that we know for sure that rising CO2 increases temperatures. Our Earth in the past has been both very much colder, we've had ice ages with glaciers as far south as southeastern Ohio. We also have had a globe which is very much warmer. We still can find mastodons frozen in the tundra with 'subtropical' vegetations -- vegetation in their stomachs indicating that we had a very much warmer Earth at that time.

And also, as you go from warming to cooling or vice-versa, there will be little ups and down as you are going up or down. How can we be sure that the very modest warming we've had now, most of which has occurred before real industrialization, the increase over the last century, how can we be sure that we're not simply on a little upswing on what is generally a downswing ~~and we in fact are heading to an ice age?~~

EIZENSTAT: The scientific data indicates, first of all, very unmistakably that the concentrations of CO2 are dramatically increasing and that this adaptability which you refer to as in fact not occurring. And that's the dramatic evidence in that chart.

I mean, it's just unmistakable. These are actual readings of CO2 concentrations. And they are increasing at a dramatic rate. And the ~~e~~ demonstrates that.

Second, there has been, according to actual measurements, a one percent Fahrenheit increase in temperature since the industrial revolution.

And last, according to the computer simulations, and calculations of physicists and mathematicians, that's embodied in this 1995 Intergovernmental Panel on Climate Change report which brought together the 2,000 world's leading climate scientists. This correlation between buildup of CO2 gases, which again, is absolutely measurable, and the temperature variation which that will produce, is they indicate clear.

BARTLETT: When CO2 is produced, pollutants are also produced. Carl Sagan warned us of what he called a nuclear winter in the event of a nuclear war, which would drastically reduce temperatures. It's very difficult to produce CO2 without producing pollutants, other pollutants. I'm not really sure if CO2 is a pollutant. But producing other pollutants which could either warm or cool our globe, depending upon whether they let in more or less energy from the sun and whether they reflected back more or less energy. The sun comes in as over a wide spectrum of wavelengths. When it is warmed up, the Earth, we then reflect back only in long wavelengths, which can be easily -- which can be easily (OFF-MIKE).

So I'm not sure whether increasing CO2 temperature will increase -- increasing CO2 concentrations will increase the temperature of the

h or not because of all of the other factors.

Sir, in the future, we're going to face the problem of producing enough food for our increasing population. Plants now live on the ragged edge. Only .04 percent CO2. They like more CO2 and grow faster and better. From that perspective, why wouldn't we be happy with a modest CO2 increase?

EIZENSTAT: Because it will have discernible impacts around the globe that will be very negative. For example, in terms of absorption, there will be much heavier precipitation which will have a negative impact, in some cases, in agriculture. And we'll have much drier soils because the absorption that will occur. And so the capacity of some countries to produce agricultural products will be severely impacted.

It is true that in some areas, ~~there will be an increase~~ in agriculture. In others, there will not. And as Secretary Rominger indicated in testimony today before the Senate Agriculture Committee, the more discernible impacts will be on forests probably then on agriculture. And there, there will be very severe changes in forest patterns.

SENSENBRENNER: The gentleman's time has expired. Gentleman from Pennsylvania, Mr. English.

ENGLISH: Thank you, Mr. Chairman. I appreciate the opportunity to appear here. Secretary Eizenstat, it's certainly a privilege to have someone of your long service and caliber here before the committee and in a position to perhaps answer a couple of questions.

I am very concerned about the economic impact of this treaty on my home state of Pennsylvania. You are very familiar with our unique combination of heavy industry, our concern with a variety of emissions issues and not just this one.

I'm concerned that a study by Wharton Econometrics has predicted a very substantial economic impact for Pennsylvania. And I'd like to comment a little bit on their findings and get your response on the strength of their interpretation of the treaty.

ENGLISH: They have predicted 32,200 job losses for Pennsylvania if this is implemented, including 22,000 manufacturing jobs. And I have perhaps the biggest concentration of manufacturing in the state in my district. So that gets my attention.

They have predicted that it would lower Pennsylvania's wages between 2.8 percent and 1.5 percent, which is cumulatively a substantial impact. It would mean higher energy costs, and therefore higher grocery, housing, and medical costs. And they predict a cost per year of roughly \$255 per person.

Can you do anything to dispel that gloomy picture out of Wharton?

EIZENSTAT: Yes, sir, absolutely, because that gloomy picture does not take into account the kinds of flexible mechanisms, including trading, that we have, that in a major way reduce the cost.

Janet Yellen is not here to give her full testimony. Hopefully, she will be invited to do so, so you can go into this in more detail.

But again, if I may just summarize the testimony that she's given which indicates a very modest cost. And that's why we say that this is an affordable insurance policy.

She suggests that the total cost of attaining the Kyoto targets with the kinds of flexible market mechanisms that we have built in would amount to about \$7 billion to \$12 billion a year in the period 2008 to 2012. This implies that overall costs, excluding -- excluding -- the benefits that you get from climate change initiatives. And this would be, you talked Congressman Bartlett, about pollutants. You'd have less pollutants, less asthma, less problems of a health kind.

But also, even excluding cost-mitigating factors like sinks and the president's electricity restructuring program, she estimates would reach roughly only one-tenth of one percent of projected GDP in 2010. And then as I indicated I think before you came in, we're talking about emissions prices of \$14 to \$23 per ton, an increase in fuel oil prices over this 15-year period of only five to nine percent, gasoline prices, three to four percent, average household energy bills over the whole period only between \$70 and \$110 per year.

ENGLISH: Mr. Secretary, do you have anything that specifically applies that analysis to Pennsylvania?

EIZENSTAT: I don't believe that the Council of Economic Advisers has done state-by-state breakdowns, but we'll be glad to supply

Chairman Yellen's testimony, which is the most definitive statement we have on this.

ENGLISH: I would be grateful for that.

I have one follow-up question if I have time. And that is, as you probably know, Pennsylvania has the largest concentration of trade adjustment assistant claims relative to Mexico of any state in the union. Needless to say, we are very concerned about the impact of NAFTA. And there has been some public dissatisfaction with the administration's enthusiasm for NAFTA.

I am very concerned that this treaty does not apply similar restraints and similar regulatory burdens to a number of "developing" -- quote -- unquote -- countries, including Mexico, including China, including India. And our concern, frankly, is that this creates an enormous regulatory burden imbalance which will have the effect of creating more jobs than we already have to Mexico.

I realize the administration has made public statements to the effect that they will be seeking to engage these countries. But so far, they've been resistant.

May I ask you, do you have any confidence, and can you give us any confidence, that Mexico is going to be willing to participate and share in the regulatory burden in a way that they haven't, for example, under the labor and environmental side agreements.

EIZENSTAT: Let me respond to your question, which is well taken in two ways. First of all, we do not intend to have the United States of America bound by law, which means Senate ratification, unless and until we do get meaningful participation by key developing countries.

Second, with respect to Mexico in particular, Mexico, Argentina, several of the Central and Latin American countries, were the most interested in participating. ~~And we believe by our bilateral~~ relationships that they will increasingly be so.

I mentioned, I think perhaps before you came in, Congressman English, that I feel quite strongly that a country like Mexico or South Korea that's in the OECD or Argentina, that wishes to be in the OECD, ought to assume the kinds of obligations that go with that kind of membership. And that's the kind of effort we're going to be urging on them.

So I do think that we're going to see real participation by Mexico. And that will be one of our clear targets of opportunity.

ENGLISH: Thank you for your illumination, Mr. Secretary. And thank you for your patience, Mr. Chairman.

SENSENBRENNER: Oh, you're very welcome, Mr. English. The gentleman from Michigan, Mr. Ehlers.

EHLERS: Thank you, Mr. Chairman. A number of comments, perhaps a few questions.

I thank you for being here, Mr. Secretary, and some of my science -- my comments are going to be about the science involved. And I apologize for burdening you with that, but the other two hearings that we had on this topic, I had to leave before question period. And I just want to make these points.

As a scientist myself, I like to deal -- separate the facts from conclusions. And I think, well, let me list a few facts first. First of all, CO₂ is increasing in the atmosphere.

I don't think there's too much question of that. I'm curious why we don't have a worldwide average there rather than just Mauna Loa. I think it's worth looking at it throughout the country and not -- throughout the world and not just one location.

But CO₂ is increasing. I would also mention that methane is

heating, which is far more of a problem in terms of its retention of heat in the atmosphere than CO2 is.

A second fact, this does result in increased energy being retained in our biosphere. And I don't believe there's too much question about that. Greenhouse gases do retain energy here.

I also will concede another fact in your area, economics, rather than my area, science, and that is that market-based emission trading does seem to work quite well.

The conclusions, however, I think that you seem to hold very affirmatively are subject to question. For example, global warming, if you look at the graph on the right, which you referred to a number of times, it's very hard to discern any observable pattern up to this point.

And we may well speculate that the temperature is going to go up in the future. But there's considerable controversy about that. And it certainly is not at all evident from the graph there. As you can see, it's relatively flat for the past couple of centuries, with lots of squiggles.

So I think we have to be very careful about assuming that the energy that's being dumped in and retained in the biosphere is going to manifest itself as temperature increase. I think -- and there is a lot of uncertainty here. But I think it's far better to talk about global climate effects rather than global warming.

Then the question is what are the climate effects? And there I believe there is even greater uncertainty than there is with the warming effect.

The further assumption you seem to make is that the climate effects would necessarily be bad. And since I'm very conservative in my thinking, I share your concern that they might be bad. But again, that's not a foregoing conclusion because our climatic system is so incredibly complex.

Just take, for example, the impact of El Nino, which is fairly well-known after this year. Florida experienced some terrible tornadoes, much greater intensity than they normally have. And this is blamed on El Nino. And that's terrible.

At the same time, the climate change, as a result of El Nino, spared them from hurricanes. Last hurricane season, they had very little difficulty.

So -- and I'm just giving that example to illustrate how difficult it is to predict whether the effects of climate are going to be good or bad. The effects of El Nino in Florida are both good and bad. And in this particular case, I suspect the good outweighed the bad.

That's not true of California, where they have had very severe storms. And they have not received much benefits.

The Midwest, it's been an absolutely wonderful winter except for those who like winter sports. It's been very warm. Our snowfall in Michigan has been only 40 inches for the year, which is high by Washington standards, but about half the normal.

It's been a wonderful winter. Yet we may have a drought next summer as a result of El Nino. Again, very complex. And it's hard to determine whether it's good or bad.

My point of all this is it's very difficult, even though we can agree on the facts about CO2, methane, and so forth, it's very difficult to determine what -- how this is going to manifest itself in climate change and what is good and bad. And that also recreates great uncertainty in what to do about the CO2 and how to resolve that.

One last point I would make. And this is political rather than strictly scientific, although there is some science with it as well.

EHLERS: I think it is a grave mistake to exclude the developing nations from requirements. And I say that with considerable hesitation because I have served on several task forces and I've chaired one dealing with the problems of developing nations, particularly vis-a-vie World Hunger.

And I sympathize with the need for them to develop their economies. However, the difficulty you get into, if you exclude them at this point and they are at a point where they are in fact developing, they're developing their industry, they're developing their energy sources, they are likely to install sources that are going to result in substantial emissions.

Even if we for some reason cannot impose requirements on them now, I would hope for you to make it clear in writing that they will have to meet certain requirements within a certain time span, and for the simple reason -- I'm almost there, Mr. Chairman -- for the simple reason that the decisions they make now as to which kind of power plants get put in, what time -- what other equipment they get, has to be colored by the fact that they have to buy low-emission equipment now.

Otherwise, we will face a problem 10, 15 years from now. And they will say: I'm sorry. We got all this in, we can't afford to change it.

I'm sorry for overrunning my time. And I just wanted to register all those points. And I hope that you factor those into your thinking as you continue your work on this.

EIZENSTAT: Thank you. Do I have time to answer that?

SENSENBRENNER: Of course you do.

EIZENSTAT: OK. All right.

SENSENBRENNER: Hopefully briefer than the question.

(LAUGHTER)

EHLERS: No, the question was brief. The statement was long.

EIZENSTAT: I thought it was a yes or no answer, Mr. Chairman.

SENSENBRENNER: (OFF-MIKE).

EIZENSTAT: First of all, I very much appreciate the erudite quality of your statement and Congressman Bartlett's. It's obvious that you've given a lot of thought to this.

Let me respond in a couple of ways. First of all, I couldn't agree with you more on the developing country piece. They are going to be installing the next generation of power plants, the next generation of industrial plants.

And it's important that we catch them at this point because otherwise, they'll say, well, we've just put in the next generation. And it will be another 15 years before we can do anything.

So there is an urgency to our trying to get the developing countries in. And that's why the president has said he simply won't bind this country to binding obligations unless and until we get this meaningful participation.

So that, I agree with you.

Number two, obviously, I agree with you on the degree of CO2 is increasing, that it is in fact trapping greenhouse -- that greenhouse gases are being trapped. I think where I would perhaps depart a bit is in terms of the likely effects.

Here, we do have a one percent increase in temperature over the last hundred years, since the industrial revolution. Second, we have very clear computer simulations indicating the relationship between this buildup in concentration, which is dramatically increasing, as you yourself indicated, and the likely temperature effects.

Now what you said is well, that is not certain. We can't be sure that it will lead to warming or even climatic effects. But the computer simulations are there.

And what I would challenge you, and I don't mean this personally, but you as a collective body in the Congress and all of us, and that's why we call it an insurance policy, on which side would you prefer to err? We've got this growing body of evidence about the concentrations. We've got the computer simulations.

The kinds of policies that we're talking about are, in any event,

energy policy. They're good in terms of efficiency. If we wake 10 or 15 years from now and this trend, which the computer projections indicate is indeed happening, we'll be in a hell of a fix. The costs will be much more expensive, much more dramatic.

And that's why we say let's act now. Let's take out a reasonable policy with a reasonable premium. Let's begin to take some decisions.

I mean, this doesn't go into effect until 2008 to 2012. But these concentrations increase. And as you know as a scientist, there is a lag, I'm told, of about 20 to 30 years between emissions, which are already occurring today and tomorrow and the next day, and the concentration levels and temperature increases. So if you assume that there is a lag of 20 or 30 years, then by not acting now, we will have assigned ourselves to go down what could be a dead-end road.

So I think that in terms of prudence, we are much more, certainly given the scientific data we have, we're much more, I think, likely to take the right fork in the road if we begin these modest policies. Nobody's talking about, you know, choking off the economy.

We pass the president's tax credits. We get our technology initiative going. We work on getting emissions trading off the ground. We work on getting developing countries involved.

Just think if we sat back, I mean, under your own scenario where talk about the next generation. Suppose we just sat back and we did, well, it's not a problem. Go ahead and build all the coal-fired plants without the latest technologies and we'll come back 15 years from now and see what happens.

That would be by your own statement I think a definition for a really catastrophic event. We want to engage them now. We need to engage them now. It may take years to get them engaged. But Lord knows if we don't start now, it will be much more costly and much more difficult to engage them later.

SENSENBRENNER: I think we do need a second round of questions. And I'll start off.

Secretary Eizenstat, I'd like to get us back to discussing the protocol that you signed in Kyoto rather than a whole bunch of hypotheticals or suppositions that you just said in response to Mr. Ehlers' question.

When Ms. Rivers from Michigan asked some questions you said in response in part that this protocol can't be amended until it goes into force. And Article XV.1 says that it goes into force on the 90th day after the date in which not less than 55 parties, incorporating parties, including annex one, which accounted for at least 55 percent of the total CO2 emissions in 1990 have signed, ratified, and deposited their instruments of acceptance.

Now since you have said that we've got to have some amendments

ative to LDC participation as well as clarifications, whether it
uses to an amendment, or whether it means an...

(AUDIO GAP)

... to the protocol. Isn't the United States stuck since it
can't propose amendments until the treaty comes into force in having
to deal with this treaty as you signed it until we can get amendments
adopted either by the consensus mechanism or by the three-quarters
vote mechanism in Articles XX and XXI.

EIZENSTAT: Not necessarily. For example...

SENSENBRENNER: Well, then why not necessarily?

EIZENSTAT: ... because we can get a supplemental protocol passed
that would be included in Kyoto. ~~That is one option.~~

SENSENBRENNER: Yeah. And under what mechanism would that be?
Would that be the consensus mechanism that we had in Kyoto? Or would
it be some other mechanism?

EIZENSTAT: It would probably have to be under the consensus
mechanism.

SENSENBRENNER: And since the LDCs were so successful in knocking
even voluntary assession with that famous floor amendment that I
referred to a couple of times, what makes you believe that LDCs like
China and India would completely reverse a very hard position that
they took in Kyoto, in Bonn, and in Berlin that they were not
interested in getting on board this protocol.

EIZENSTAT: I think there is no such certainty. One cannot be
certain that they would reverse themselves. I think this is going to
be, again, a learning curve for them. And we hope that we can achieve
it. But we certainly can't guarantee it.

SENSENBRENNER: And if we fail in this like we failed in Kyoto,
then is the administration prepared to walk away from this process and
state that it's fatally flawed?

EIZENSTAT: We've no reason to walk away from the process
because...

SENSENBRENNER: Well, why? We've lost once. And we've lost
twice.

EIZENSTAT: No, sir. Because we have won, first of all, and I
don't want to just be repetitive, all the things that I've talked
about, we've gotten from the developing countries, reasonable
reduction rates that are competitive with our competitors, the
flexible market-based mechanisms. All of those things are embedded in
the agreement. We don't want to walk away from that.

SENSENBRENNER: But, Mr. Eizenstat...

EIZENSTAT: And second -- wait a minute, second...

SENSENBRENNER: ... you know, you say yourself that the emissions trading mechanism is subject to further definition and clarification at Buenos Aires or at some other place. What happened is that we gave the EU almost complete unfettered emissions trading within the membership of the EU and then we disadvantaged ourselves where we do not have the emissions trading with ourselves the Russians, the Japanese, the Ukrainians, the Australians, the New Zealanders, the so-called juice can countries.

So, you know, what incentive, you know, is there for either the Europeans or the LDC nations to agree to give us the type of emissions trading that they gave themselves with American acceptance at Kyoto?

EIZENSTAT: I think two things.

(AUDIO GAP)

But they want emissions trading outside their bubble. They want to be able to trade just as much as we want to be able to trade. And so they have an incentive to make that efficient. And they've told me again, this is coming from the representatives from the UK, from other countries in the European Union that they want to be able to do so.

SENSENBRENNER: But this gets us back that if we don't succeed in that, we are stuck with the treaty which you signed on behalf of the United...

EIZENSTAT: I didn't sign any treaty.

SENSENBRENNER: ... well, you agreed to on behalf of the United States in Kyoto. And since it's apparent from your testimony that the administration does not want to face the fact of walking away from this process, then we are kind of caught with something that we agreed to but which we don't like and which we think needs to be amended, but which has to go into force before we can even propose amendments.

EIZENSTAT: Yes, sir, but we will not be binding ourselves legally, even if we sign it. Signing it is a way of indicating that for this first step, we've taken a first step we want to solidify. But we have no binding obligations whatsoever until there is a second step. And that second step is the developing country participation.

However long that effort takes, we should pursue it. I mean, again, Congressman Ehlers said it as well as anybody can.

SENSENBRENNER: But...

EIZENSTAT: In the sense that they are putting in this next generation, we want to have an impact now on what they do. And we won't have that impact...

SENSENBRENNER: ... but...

EIZENSTAT: ... if we walk away from the process.

SENSENBRENNER: ... but, you know, I practiced law in a small town. And when you agree to a contract, and eventually sign it, and you said that this is going to be signed by March 15 of next year, then that's the deal unless you get the parties to agree to modify the deal.

Now you heard from the Chinese with their intransigence just as much as our delegation heard from the Chinese. You know, if they end up preventing consensus from taking place, then we're stuck with a deal that you have said is an incomplete one. And what are our alternatives as a country either to be stuck with the deal and to try to change it, no matter how frustrating or how unsuccessful we may be, or walk away from it.

EIZENSTAT: Well, I practice law too, in a large city.

SENSENBRENNER: Yeah.

EIZENSTAT: And the contracts are the same in small cities as in large cities. This would be what I would call at best a conditional or contract or statement of principles. And every country in the world realizes that every other country has to go through its ratification process.

Signing it is not legally binding. Any country, Parliament in the UK is going to have to pass it, for example.

SENSENBRENNER: Well, but their process is different because the government is in the majority.

EIZENSTAT: That's correct...

SENSENBRENNER: And most of it...

EIZENSTAT: ... and we're not going to do it -- we're not going to even submit it, not because of whether the Republicans or Democrats control Congress, but because the Congress -- the Senate has set 95 to zero, a very clear statement. And it, by the way, is a statement we agree with. That is that you have to get developing countries involved in this process...

SENSENBRENNER: Then, then, if, if...

EIZENSTAT: ... before we will bind ourselves.

SENSENBRENNER: ... if we agreed with it, then why didn't you say at 2:00 in the morning when this amendment was being rammed through that this is a deal breaker and walk out?

EIZENSTAT: Well, we said a lot of unprintable things at 2:00 in

morning when that happened, I must say.

SENSENBRENNER: But how about meaning that one?

EIZENSTAT: But the reason we didn't walk away from the process is because we had already achieved so much else, number one. And number two, because we said we want everybody to be on notice the United States is not going to legally bind itself unless and until you play in this game. If you don't play, we don't legally bind ourselves.

SENSENBRENNER: But you've announced that you're not going to walk away from the process, so what...

EIZENSTAT: We want to have an influence on the process, Mr. Chairman. We will lose our influence on the developing countries. We will lose our influence on the capacity to get good trading rights if we take our marbles and go home.

SENSENBRENNER: But without the developing country participation, our marbles are never going to be in play because you and I both know that the Senate isn't going to ratify it after 95-to-nothing vote.

EIZENSTAT: Not only will they not ratify it, we won't even submit it.

SENSENBRENNER: OK. I thank the secretary.

Gentleman from Maryland.

BARTLETT: Thank you very much. I would like to (OFF-MIKE).

I'm sorry. I'd like to return as the second scientist in Congress to a discussion of the -- of some of the scientific aspects of this.

I think from a scientific perspective, we can't be sure that we are moving toward general global warming or moving toward another ice age. You could argue both those.

Matter of fact, about 20 years ago, the same people arguing for global warming were contending we were moving to an ice age.

EIZENSTAT: Neither one is a terribly attractive option, if I may say so.

BARTLETT: That is correct, sir. And it may be that these are simply some little instabilities that are not moving in either direction.

If we are moving to modest global warming, then I think clearly world would be different. I think that you would be hard-pressed to say that it would be worst since in the past we have had a world

ch is both very much cooler and very much warmer.

I think that Canada and Russia might benefit from a little global warming. Our corn belt would move north. Clearly, we would have changes, and I'm not sure that we could now say that they would -- that we would have a better or a worse world because of that.

You mention energy efficiency. And I think, sir, that there's maybe another approach that one could use to achieving the same objectives that you want to achieve. And is it by looking at where we get our CO₂.

Most of it comes from fossil fuels. Fossil fuels are not forever. We do not have a limitless supply of fossil fuels. We have an enormous petro chemical industry that uses fossil fuels in large measure. One could say that oil and particularly gas are too good to burn because they form the basis of a very large and important petro chemical industry.

If we were predicating our energy efficiency initiatives on the basis that this was necessary in order to one day, it may be sooner or later depending on who you talk to, run out of fossil fuels, which brings us to a very uncertain energy future in the world. I think that you might have a more usable argument that you could get more people on board.

You meet exactly the same objectives. But you're riding a different horse and an easier one to sell I think to get there.

EIZENSTAT: OK, let me respond to both, first in terms of not making things worse. I think that, if I may say so with all deference, simply not the case.

A warmer Earth would speed up the global water cycle, the exchange of water among the oceans, atmospheres, and the land. Higher temperatures would cause more evaporation. The soils would tend to dry out faster. Increased amounts of water in the atmosphere would mean more rain or snow overall.

In addition, we have already measured an increase of four to 10 inches over the last hundred years in the mean sea level. Because global warming will increase sea level concentration, sea levels even more for two reasons, first, because simply, water expands when heated, but also because discernible, measurable melting of glaciers is occurring. This will put low-lying areas at risk.

I think it was you, Mr. -- Congressman Bartlett that mentioned, if not it was perhaps Congressman Ehlers -- that the methane problem. Well, formerly frozen soils, the permafrost in Alaska and in Siberian Arctics have already begun to melt. Again, this is measurable. This is scientific.

This will damage ecosystems and infrastructures. But it also will release more methane.

There also would be a human health problem. This warming would exacerbate air quality problems. You yourself talked about the increased pollutants.

Diseases that thrive in warmer climates like malaria and yellow fever would increase. It's been estimated by scientists by the end of the next century that there would be an additional 50 million to 80 million cases of malaria each year if this climate change continued unabated. So these are all measurable.

One other thing is, in terms of evidence. Between 1981 and 1991, the length of the growing season in the northern high latitudes increased by a total of up to 12 days, while in other areas, that has not occurred.

So there really are measurable, discernible activities which are occurring. We think, on balance, ~~they would be more negative than~~ they would be positive.

BARTLETT: That's a supposition we don't know for sure. But I think that achieving energy efficiency through the incentive of husbanding our finite supplies of fossil fuels is a very salable idea.

EIZENSTAT: May I just say on the fossil fuel thing. Going back to my earliest days in government when I was working in the Carter White House on the energy policies there, one of the things that we -- me make two points.

Number one, we've underestimated the amount of fossil fuels that this planet has. We keep discovering more in the North Sea and more in China and more in the Caspian Basin and so forth. That aside, there obviously is a finite amount that the good Lord put on this planet.

The steps that we're suggesting taking here will have the benefit of reducing our dependence on fossil fuels. And that, in and of itself, as you just indicated very eloquently is a real benefit. If none of this ever occurred, if this all tends to be inaccurate, the steps we're taking will have a discernibly positive benefit in terms of reducing our dependence on imported oil, for example, which will help our trade deficit and it will prolong the period of time we have fossil fuels on the Earth.

So there is a discernible benefit. I would turn it the other, if we don't act, and you turn out to be incorrect, then we will have an irreversible situation.

SENSENBRENNER: The gentleman's time has expired. Gentleman from Illinois, Mr. Ewing, has not had a chance yet.

EWING: Thank you, Mr. Chairman. A number of very interesting points.

You indicated that we were wrong in the amount of fossil fuel on

planet, our scientists.

EIZENSTAT: Not scientists. The policymakers, when we were developing our energy policy in the 1970s, we were told by a number of estimates that the demand and supply curves were going to cross in 1985. And instead, we found a lot more fossil fuels and energy than we thought.

EWING: Well, I just think that points out the fallibility of the federal government estimating any of these, whether they do it with scientists or bureaucrats or whoever.

You made the comment that by implementing the treaty, we'd have a lot of positive benefits, correct? Even if the global warming wasn't a problem?

EIZENSTAT: Yes, sir.

EWING: OK. How does that match up with the, you know, the projections, they could be wrong, 180,000 jobs would be lost in Illinois? We'd lower our wages between 3.1 and two percent.

Now, you know, all this lowering of the trade deficit, we'd lower the trade deficit I'm sure because without those jobs, we're not going to be buying foreign products. When you damage the economy even a fraction of that amount, you have done major damage that I think offsets these possible benefits even if you're wrong in the global warming.

EIZENSTAT: Congressman, Ewing, first of all, the estimates you made that I suggested in terms of warming and trends was not done by the federal government. The most definitive judgment was made by an intergovernmental panel, scientists, private scientists generally from 2,000 -- 2,000 scientists from 50 different countries, plus the fact that federal government people are human beings as well.

Second, with respect to the estimates...

EWING: What did you mean by that, sir?

EIZENSTAT: That in other words, a scientist working for EPA has often times a very good judgment as well, even as good as one not working for EPA. But the judgments we're giving you are not based on federal government's.

EWING: Yes, well, you don't need, please don't lecture me on that. I can tell you that...

EIZENSTAT: I'm not lecturing you on anything. I'm just saying that...

EWING: ... you are -- you are indeed promoting the policy of this administration, whether it's backed up scientifically or not.

EIZENSTAT: I would hope I'm promoting -- sir, that's what I'm paid for.

EWING: That's right. Well, let's just have that on the table so we all know whose paycheck and where it comes from. I'm paid for by the people I represent.

EIZENSTAT: I appreciate that. I respect that very much.

EWING: Thank you.

EIZENSTAT: And I'd like to then get to the question of the people that you represent.

The estimates that you have given we think are not indeed accurate because they don't take into account what we were able to achieve in Kyoto in terms of ~~cost-reducing measures like emissions trading~~ that substantially reduce the cost. We just released our own estimate yesterday, Congressman Ewing, of the costs of global warming with what we got in Kyoto.

And that amounts, as I've mentioned several times, and I don't want to be repetitive to the other who were here before, of \$7 billion to \$12 billion per year. It translates into very small increases in energy prices and in gasoline prices and an increase in household

energy bills by 2010 of around \$70 to \$110 per year. And that would offset almost fully if the Congress passed the electricity restructuring and deregulation proposals we've suggested.

In addition, there have been, the chairman mentioned at the beginning, the sort of gloom and doomers and so forth. I've tried to be as calm and as candid as I can about the situation here. I'm not being hyperbolic. I'm not being Chicken Little.

But over the years, over the last 15 or 20 years, at every turn, when there's been an effort to pass the Clean Water Act or the Clean Air Act or to deal with the ozone problem, we've always been told that we can't afford it, that it will wreck the economy. We've got an economy that is the envy of the world.

We've created 15 million jobs over the last five years, Europe has created with a larger workforce about two million jobs. We've got the lowest unemployment rate in 25 years.

We are, I can assure you, and I think you know this from your own observations, we are literally the envy of the developed and developing world. And we've done it by also improving our economy, our environment.

We believe, Congressman Ewing, we can do the same thing here, and a lot of the way we'll achieve this in Illinois as well which is a great industrial heartland, but also a great heartland for high-tech -- I was born in Chicago, my family lives in Chicago -- Chicago is a

center for high-tech. The kind of technologies which Texaco has been talking about, which Jack Smith from GM has been talking about in terms of a whole new generation of cars that can get twice the gas mileage, this is going to release a tremendous outburst of U.S. technology, which will mean more jobs and more improvement for the people of Illinois.

SENSENBRENNER: The gentleman's time has expired.

EWING: Mr. Chairman, could I have...

SENSENBRENNER: John...

EWING: ... 30 seconds? The witness took almost all my time...

SENSENBRENNER: Well...

EWING: ... in some lecture. But I just would like to make the record clear here that all of us are for improving the environment. I've talked with people who came back from Japan and the negotiations. And I think there was some problems in those negotiations in how much we gave away.

We have something to negotiate. And we should be very firm on that. We should work for the best situation for the whole world and not expect it all to happen here in the developed nations and in the United States.

And that's probably what you have to sell to this Congress if you -- and I'm not asking for a response. My time is up, and I've been told that I'm done. I...

EIZENSTAT: I want to say that I agree wholeheartedly with your last statement, that is to say that we have a lot of work to do, Congressman Ewing, in terms of getting other countries involved.

We got the developed countries. We've gotten what we want there. We do not have the degree of participation by developing countries we need for a complete product. This is a first step and a first step only.

SENSENBRENNER: Now I did promise Secretary Eizenstat he'd be out by 2:00. So I'd like Mr. Ehlers and Mr. English to argue amongst themselves on who has the last five minutes to ask questions.

The gentleman is recognized for two exact minutes.

EHLERS: I just want to reinforce the comment made earlier. I'm concerned about your statement that some of these -- that all of these effects are measurable. Not all of them are measurable.

Also your reference to scientists agree. Not all scientists agree. There is considerable uncertainty as you get into some of these areas. And I, as Mr. Ewing said, you're representing the

administration well. But, and I'm aware of their position, particularly the vice president. And I admire his concern for the environment.

But I think it's very important to try to deal with these issues factually with as much of a knowledge base as we have. And where we don't have it, let's get it and make the most intelligent and best decision we can.

And I caution you about talking about all these being measurable facts. They aren't. And the global warming, there is still considerable disagreement on that. I don't think there's disagreement on global climate effects that we will have.

Thank you, Mr. Chairman.

SENSENBRENNER: The gentleman from Pennsylvania is recognized for precisely three minutes.

ENGLISH: And I will keep this brief. And I have really two questions so I'd ask you to be compressed in your responses. You have been.

First of all, following up on the chairman's comments, if we do not have binding treaty obligations until the Senate signs on and approves the treaty, one, will the administration promise not to implement the treaty by regulation until after the Senate ratifies? A second part, doesn't any delay in implementation make the job of reducing CO2 even tougher?

EIZENSTAT: Very quickly. Obviously, we are trying to get through Congress a jump start through the R & D efforts. But in terms of binding obligations, we do not intend in any way, shape, or form, through the back door, the front door, the side door or any other efforts, to bind this country or any of the sectors of this country until the Senate has acted in a constitutional manner.

ENGLISH: And you're not concerned that the delay makes CO2...

EIZENSTAT: Absolutely. That's one of the reasons we feel a sense of urgency about it.

ENGLISH: Final question. One technology that has not been proposed as part of your strategy for reducing emissions has to do with nuclear. Do you believe that we need to expand the use of nuclear energy? And two, do we need to encourage and to facilitate other countries like China utilizing nuclear, perhaps through technology transfer down the road?

EIZENSTAT: Let me answer that in two ways. First of all, from your state, which is one of the great coal producing states, one of the parts of the president's initiative is a clean coal technology effort.

And this is again why I don't think we should write coal off in our energy future. We can produce cleaner coal.

Second, with respect to nuclear. I'm going to give you my personal view. I can't speak for the administration. I don't make energy policy.

My personal view is nuclear power has to have an important role in the future, an increasing role in the future. If we want, for example China, to move away from heavy coal without modern technology, and China will be, they're already the second biggest emitter, they'll be the biggest emitter, then nuclear power is key.

The president certified just a few months ago at the time of the summit that they could now receive nuclear energy. And this would be a big job creator. Westinghouse is in your state, for example. And power -- nuclear power plants in places like China I think have to be part of this solution for developing countries.

ENGLISH: Thank you very much. Thank you, Mr. Chairman.

SENSENBRENNER: This concludes the hearing on time.

EIZENSTAT: Thank you, Mr. Chairman.

SENSENBRENNER: We'd like to...

EIZENSTAT: This is the only thing about Kyoto that's ever been on time, I think. And I appreciate it.

SENSENBRENNER: Yeah. I would like to thank you for coming up for a very lively discussion. I'm sure it will not be the last one.

And the committee is adjourned.

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**Senate Agriculture
March 5, 1998**

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HOLDS HEARING ON THE KYOTO CLIMATE TREATY;
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HOLDS HEARING ON THE KYOTO CLIMATE TREATY
~~March 05, 1998~~

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U.S. SENATE COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY
HOLDS HEARING ON GLOBAL WARMING

MARCH 5, 1998

SPEAKERS: U.S. SENATOR RICHARD G. LUGAR (R-IN), CHAIRMAN
U.S. SENATOR JESSE HELMS (R-NC)
U.S. SENATOR THAD COCHRAN (R-MS)
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U.S. SENATOR PAUL COVERDELL (R-GA)
U.S. SENATOR RICK SANTORUM (R-PA)
U.S. SENATOR PAT ROBERTS (R-KN)
U.S. SENATOR CHARLES E. GRASSLEY (R-IA)
U.S. SENATOR PHIL GRAMM (R-TX)
U.S. SENATOR LARRY E. CRAIG, (R-ID)

U.S. SENATOR TOM HARKIN (R-IA), RANKING
U.S. SENATOR PATRICK J. LEAHY (D-VT)
U.S. SENATOR KENT CONRAD (D-ND)
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ADVISERS
DEAN KLECKNER, PRESIDENT, AMERICAN FARM BUREAU
FEDERATION
FRED KRUPP, EXECUTIVE DIRECTOR, ENVIRONMENTAL
DEFENSE FUND
MARY NOVAK, SENIOR VICE PRESIDENT, WEFA INC
MARTY STRANGE, SENIOR FELLOW, CENTER FOR RURAL AFFAIRS

[*]

LUGAR: This Senate hearing of the Senate Agriculture Committee is called to order. We'll begin promptly, and senators will be coming in. The distinguished ranking member will be here in a short while and be recognized for his statement when he arrives.

We will have roll call votes scheduled on the floor at 10:30 -- two of them -- which will create a break in our schedule, so we'll attempt to maximize our time by getting started early, and we're looking for Senator Wyden, who wants to testify, and will be recognized, and here is Senator Wyden.

Senator Wyden, I will make an opening statement, and then I will recognize you, because I know you have time constraints, and we're delighted that you're here this morning.

In December, leaders from 150 countries gathered in Kyoto, Japan to address the issue of climate change. The result, the Kyoto Protocol, has met with intense controversy. It is unlikely to be ratified by the Senate in its present form.

In preparation for Kyoto, the Senate passed the Hagel-Byrd resolution in July, urging the president not to sign any treaty while failed to include emissions limitations on developing countries. However, the United States signed the Kyoto Protocol, with administration officials conceding that it does not include, quote, "meaningful participation," end of quote, by the, quote, "key developing countries," end of quote.

China and other developing countries have reportedly expressed adamant opposition to limit even their rates of growth in greenhouse gas emissions.

The national debate over the protocol may force this nation to overcome its tendency to separate energy and environmental policies. In reality, many of our environmental problems are related to our need for energy. Changes in energy policy are essential to addressing environmental concerns.

Events beyond our borders also have tremendous impact on American energy security and environmental interests. As the economies and populations of China, India, South Korea, Mexico, Brazil and other key

Developing countries rapidly increase, so too will their need for energy. And such growth will fuel the greenhouse gas problem, increase world dependence on Persian Gulf oil and result in immense transfers of wealth to the Gulf region.

And, as current events in Iraq remind us, dependence on oil from unstable nations in the Persian Gulf exacts a substantial security cost for our country.

The United States imports now 46 percent of its oil. U.S. dependence on Middle Eastern oil will grow in coming years, despite new discoveries in other regions of the world, and, by 2020, the energy Information Administration estimates that 65 percent of the world's oil exports will come from the Persian Gulf.

The United States currently emits 22 percent of the world's greenhouse gases, while generating ~~26 percent of the world's~~ wealth. As our economy and our population grow, so too will our carbon emissions. The Energy Information Administration projects that United States carbon emissions will increase 34 percent from 1990 to 2010, assuming a very modest economic growth rate of only 2.2 percent per year.

If economic growth is higher, our emissions growth is likely to be even greater. We must find ways to address the climate change problem without suppressing our economic growth or hurting businesses, jobs and workers.

At Kyoto, administration negotiators agreed that we would reduce our greenhouse gas emissions by seven percent below 1990 levels by the period of 2008 to 2012. To meet this target, which is only 10 to 14 years away, it's estimated we must reduce our levels of greenhouse gases in 2010 by 30 percent or more from forecast levels. A 30-percent reduction would amount to approximately 560 million metric tons of carbon equivalents annually.

Where will these reductions come from? According to the Energy Information Administration, a high-technology would produce productions of only 79 million metric tons of carbon equivalent, which is a four-percent reduction from the projected 2010 levels. There are also opportunities for increasing the carbon storage capacity of our forests and soil, which administration estimates show might reduce our reduction obligations by a similar amount.

The administration is reportedly relying upon international trading of emissions and purchases of credits under the Clean Development Fund that would account for a large portion of our reductions. Russia and Ukraine are said to have paper emission credits to see, because their levels of greenhouse gas emissions are projected to be lower in 2010 than they were in 1990. If we cannot meet our obligations under Kyoto by ourselves, would we then purchase emission permits from Russia?

To address these many issues, I believe the president should

publish an inter-agency energy and environmental security task force. Such a task force should include the National Security Council, the Council of Economic Advisers, and high-level representatives of pertinent agencies, such as USDA, Energy, Transportation and the Treasury.

We cannot cope with any of our pending environmental or energy security problems without a new energy policy, and we must also address the serious threat of worldwide deforestation. Experts indicate that about 20 percent of the increase in greenhouse gas concentrations is due to the elimination of carbon sinks in our soils and in our forests. We are losing 30 million acres of tropical forest per year.

Yet the Kyoto Protocol may not allow the United States to count projects which we fund in developing nations to avoid deforestation and to promote sustainable agriculture as part of our contribution to addressing the climate change problem.

Today in this committee, we look forward to the testimony of key administration officials involved in the negotiation and study of global climate treaty preparation. We also welcome representatives from the agriculture community, the private sector, and environmental groups to share their impressions of the Kyoto treaty and its effects on the agriculture economy.

At this point, with the indulgence of my colleagues, Senator Grassley and Senator Leahy, I'm going to call upon Senator Wyden, and he will offer testimony and has a time constraint, and we're delighted to welcome you, Senator Wyden, to our committee.

WYDEN: Well, thank you very much, Mr. Chairman. I also want to -- as a new member of the United States Senate -- express my thanks to the help you've given me and my staff on agricultural issues. Practically from the day I got here, you all were assisting us on matters like H2A, the matter of agricultural labor. And we do lots of things in Oregon, but what we do best is grow things, and I just want to express my thanks to you ...

LUGAR: Thank you very much.

WYDEN: ... and to your staff. Mr. Chairman, I would ask that my full statement be placed into the record, and perhaps I could just summarize my views briefly ...

LUGAR: Very well.

WYDEN: ... this morning. Mr. Chairman and colleagues, the debate on global warming thus far has sounded like just about every other environmental debate of the past three decades. These debates always are cast as a choice between protecting the earth and protecting jobs, and, invariably, the agricultural sector is cast as villain. As in just about every other environmental debate, this has been a false choice and unfair depiction. And the fact is that

culture can provide a cost-effective way to fight global warming in an economically beneficial way.

There is a scientifically sound and cost-effective strategy that would reduce by one-quarter the nation's emission of greenhouse gases and do this without causing an economic meltdown. This is a strategy that would bring together the environmental community and industry, unite urban and rural communities, accommodate regional energy perspectives, and effectively use federal funds for public good.

This approach is not based on some brand-new, whiz-bang kind of technology. It's as old as the earth of the self, and that's abundant and healthy forests.

WYDEN: Now, unfortunately, the Clinton administration, when they proposed their plan for combating global climate change, has now warmed to the notion of using abundant and healthy forests as a key part of the strategy. They singled out, in a plan of \$6.3 billion in funds, a variety of technologies: \$2.7 billion involves automobiles and trucks; \$3.6 billion goes for incentives for technologies in buildings; a variety of tax credits and other approaches get the bulk of the money.

But the fact is, of \$6.3 billion that they are committing, not a penny has gone to sustainable forestry practices that the Forest Service has indicated could provide in the vicinity of a quarter of overall solution in a cost-effective kind of fashion.

And, Mr. Chairman, there are two sides to the global climate change equation. The total amount of greenhouse gases in the atmosphere depends on how effectively we control the sources -- emissions -- of carbon dioxide, and also on the efficiency of forests and other natural sinks to absorb carbon dioxide from the atmosphere.

Growing trees absorb carbon dioxide from the atmosphere and sequesters it in biomass and soils for long periods of time. Sound soil management practices enhance the amount of carbon stored in soils and provides a potential carbon sink comparable to trees.

Now, the Forest Service analyses have found that, at a cost from \$2 to \$20 per ton of carbon, it would be possible to approach involving sustainable forestry to address 25 percent of the overall global warming problem. The fact is that forests and technology are complementary. One-sixth of an acre of Douglas fir trees can offset 15 years of emission from one automobile.

So I'd like to conclude by offering five practical steps that I think ought to be part of a comprehensive program to deal with global warming. First, it would seem to me, we ought to focus on planting trees on the millions of acres of unforested land in our country's conservation reserve program.

Second, we ought to defer estate taxes on lands where conservation easements have been agreed to. Third, it seems to me we

it to help private landowners who are willing to put up conservation easements on their private lands by paying a modest amount of the upfront costs.

Fourth, we ought to look at reviving the Forestry Incentives Program, which encourages non-industrial forest landowners to plan trees, make stand improvements and create firebreaks on their land. This program used to reforest as much as 200,000 acres per year, but is now down to about 40,000.

And finally, Mr. Chairman, we ought to consider developing a system of carbon credits that allow CO2 emitters who undertake permanent carbon sink projects to approved credits that reduce their overall carbon dioxide emissions. These credits could be available for banking against future emissions or trading to other parties that do not undertake permanent projects. In this manner, the public pays only once to reduce carbon dioxide.

The bottom line, it seems to me, Mr. Chairman, is that, as part of this program, let's make the judgment for these projects on the merits. Let's call them on the basis of what is cost-effective and beneficial for both the environment and what we need for our economy. And I think Clinton administration's making a serious mistake by, in effect, getting into the business of picking winners and losers in this debate without some strong analyses as to what is most cost-effective.

Now, as a member of the Energy Committee, I recently asked that they furnish to me the analyses they did that went into how they made the judgments about which projects were going to be eligible for the \$6.3 billion.

I just wanted to convey, finally, that I would very much like to work with you and this committee on that as well, because I think we are in a position to show that agriculture and industry can work together with approaches in the forestry area and do, for a fraction of the cost, what is necessary in global climate area when you compare it some of these so-called "technological" solutions.

LUGAR: Well, thank you very much, Senator Wyden. I'm enthusiastic about your constructive testimony. Let me ask members if they questions of Senator Wyden prior to their opening statements. We'll entertain questions of the senator, first of all, and then I'll recognize members for opening comments.

Mr. Leahy, you have a question for the senator? Mr. Grassley and Roberts, Craig?

LEAHY: Mr. Chairman. I can only say that senator Wyden and I have been worked on a variety of forest issues, forest health issues and other pieces of legislation to make our forests more healthy. Senator Wyden brought this issue before the Forestry Subcommittee and full Energy Committee this week, as we've held hearings on the budget of the Forest Service, and I thought it was very well-placed

we have to look at the total aspects of a positive climate and, certainly, a vibrant, growing, youthful forest is one of those.

LUGAR: Well, we thank you, Senator, for your comments. Today, as in my opening statement, I pointed out what you've reiterated, that maybe a quarter of the problem could find its solution through remarkable and vigorous advocacy of forests in our country.

And the incentives to do this we have to be thoughtful about, and there are, clearly in the administration's plans, incentives for other kinds of activities. But, as you've pointed out, we need to analyze the cost-benefit ratios as well as some remarkable other aspects to the environment, the general duty of our country would come from trees.

And we thank you for taking time to come and be with us.

WYDEN: Mr. Chairman, thank you, and to the members.

LUGAR: I'm going to recognize senators now for opening statements. Before I recognize Senator Leahy, I wanted to point that this is the first hearing we have had with Senator Leahy peering down upon us. A remarkable and very beautiful portrait of the senator has been placed in the panel, and it accompanies that of Senator Herman Talmadge, who was the chairman of the committee when Senator Leahy and I first arrived ...

LEAHY: Right.

LUGAR: ... at the end of the table, which, in those days, was a long table, and we were very close to the door, where the camera is -- so far, really, from the chairman that we were unaware of his presence on some occasions, Senator Eastland's smoke having blocked him out from our view.

LEAHY: Yes, yes, yes.

LUGAR: But, in any event, sort a generation has passed, and, along with Senator Talmadge, Senator Leahy, the distinguished chairman for eight years of our committee, graces this. So, with that introduction, Pat, do you have an opening statement?

LEAHY: Well, thank you. Thank you, Mr. Chairman. I recall, as you were saying, about us sitting down near the door, and there were time, I think, that the chairman wanted the both of us on the other side of the door, when we would show the temerity to actually ask a question about what the chairman was doing.

I do recall once asking such a question when the chairman just accepted a multi-page amendment and, as the junior-most member, I had the temerity to ask what was in the amendment. He looked at me in the back, grabbed his gavel and said, "We're adjourned," and that was the end of that, and I must say, I applaud your way of handling the committee far more, Mr. Chairman, and I appreciate very much the

rait.

You've been one of the closest friends I've had in the Senate in over 20 years, and it was a very gracious gesture on your part, when you became chairman, to arrange that that portrait hang there, and your comments that you made on the day of the hanging of the portrait are words that I will remember for all my life. It meant that much to me.

I am glad to see this hearing -- I'm glad to see so many different ones throughout the administration who are here, and, I have to assume and do know, pulling together on this. I mean, this committee included provisions for climate change research in the 1995 bill, which you and I wrote into that bill, Mr. Chairman, and the committee's interest has increased since then.

Some argue that we don't know for sure that global climate change is occurring. I disagree with that. I think there is more than enough scientific evidence confirming it's changing. I know, as a Vermonter, that my own state has been the dumping ground for all types of air pollution from other places far too long, just because winds move from west to east, and for Vermont lakes and streams and forests that have been hit with that unchecked pollution for years.

You need only to hike to the top of Camel's Hump in the Green Mountains to see the impacts of air pollution or talk to those who in Missisquoi (ph) Bay to know that it's contaminated with mercury, or measure the increasing acid precipitation in what had been pristine lakes with Vermont's wilderness areas.

Now, global climate change, brought on primarily by combustion of fossil fuels may be the ultimate insult visited on Vermont's natural resources. A 1997 Environmental Defense Fund report, entitled "Global Warming in New England's White Mountains," predicts potential impacts of global warming in the range of two to six degrees Fahrenheit in New Hampshire, and Maine.

Now, in Vermont, we always welcome a warm, sunny day, and we don't have an awful lot of them, but we also need cool weather for a lot of our things -- the maple syrup industry, leaf-peepers -- the thousands of people who come to watch the changing of the leaves, something that occurs in only three places in the world, and we are one of the primary places for that. But climate changes threaten to change that. And we see a 40- to 80-percent decrease, potentially, in our ski season with climate change.

These are all matters of concern, and this is for a small state. But we've taken pride in cultivating the renewable resource, environmental technology sector. We're going to switch on the first full-scale biomass power plant to be fueled by wood chips. It's done with the Department of Energy and it's got a great potential for others throughout the country. If it succeeds, then we can be tapping into a wide range of renewable fuels that could be tailored to specific regions of the country -- switchgrass, for example, or

rcane waste. These are things that could be used, and may become cash crops for fuel.

I'll put my whole statement in the record, but I'll just lay one last thought. While we have the responsibility -- the U.S. does -- to take a lead in reducing emissions, that responsibility is not ours alone. And the upcoming negotiations should also reaffirm the commitments of developing countries and demonstrate clear steps to prevent increases in their emissions and not have it appear that only the United States has responsibility.

So, Mr. Chairman, I think these hearings are extremely important, and I applaud you for holding them.

LUGAR: Thank you very much, Senator Leahy. Senator Grassley?

GRASSLEY: Yes, thank you very much, Mr. Chairman, for starting a discussion of the Kyoto treaty, a discussion that's obviously starting now and will continue for several years before the president submits a treaty to the Senate, and probably may continue for a long time after the treaty is submitted to the Senate.

So we're starting out on an opportunity to have a very long discussion about the legitimacies of the issue, and whether the treaty is the way to solve the issue.

I think it has legitimacy -- I mean, there shouldn't be any doubt about the legitimacy of the debate, and that such a debate does not question the need for dealing with the problem of global warming or how to do it, because that discussion will go for a long period of time, and some people might question the long period of time as an effort to really hold things up.

But there is a legitimacy from the standpoint of politics, because we did have a 95-to-zero vote in support of the position that any treaty should have proportional reduction by every country in the world. So I think the Senate's on record stating, you know, where we're coming from, and this treaty doesn't go at it from that direction.

And then, obviously, still disagreement in the scientific community, not about global warming but about whether it's natural or whether it's human-promoted. So there's enough disagreement out there that anybody that raises questions about Congress having the debate that this hearing is a part of should back off.

In addition to that, I think that colleagues who, over a long period of time, have raised the point about free trade -- sending American jobs to low-wage countries -- ought to consider the impact of the Kyoto treaty, if there isn't proportional reduction in greenhouse gases by every country in the world, that there's going to be a massive shift of jobs from the northern hemisphere to the southern hemisphere, except for the country of China.

And those are exactly the same issues that people who oppose free trade are raising in the Congress all the time, and those issues will be raised by people who have questions about the Kyoto treaty -- not what it tries to accomplish, but whether it accomplishes it in a right and fair way.

Another issue that we need to think of is in terms of this being part of a 30- or 40-year debate on the North-South dialogue -- the extent of the responsibilities of the northern industrialized nations to redistribute the world's wealth all over the world. And, from that standpoint, there's going to be a massive redistribution of wealth, the same way that maybe was suggested by the Law of the Sea Treaty, which, obviously, didn't move because of the motivation behind it.

Because the fact of the matter is that you could redistribute 99 percent of the wealth of the northern hemisphere to the southern hemisphere and reduce the standard of living of the United States and other countries by 99 percent and probably only increase the standard of the living of the rest of the world by one percent, and lose the industrial engine that drives the world economy in the process.

So I hope that we think in terms of this being a long debate, not as a necessity of stalling, because there's no need to stall. It's just the legitimacies of the argument of the question of whether or not the treaty effectively and fairly does the job, but also because the issues with the Kyoto treaty parallel issues that are constantly raised in the Congress.

And what, in a sense, is good for the goose ought to be good for the gander. If it's wrong to have free trade because it might ship jobs to the low-wage countries, then it ought to be just as wrong for a treaty -- environmental treaty that does the same thing.

This issue can be solve, it will be solved, but it won't be solved until it's handled in a fair way, and anything short of doing it in a fair way, this treaty will find the same fate as the Law of the Sea treaty found.

LUGAR: Thank you, Senator Grassley. Senator Craig?

CRAIG: Mr. Chairman, thank you very much. First of all, let me tell you how much I appreciate you holding a hearing the issue of global warming and the potential impact of any Kyoto agreement or accords as it relates to U.S. agriculture and U.S. agricultural production.

It is an issue that must be debated, as my colleague from Iowa has just said, but I think it ought to be debated in the context of knowing where we go before decide to go there, that is really fundamentally what is now at hand with us, and this administration as it relates to initiatives proposed in context of a potential treaty the issue of global warming.

My colleague from Kansas and I were recently in a unique place in

world -- we were at the South Pole. And I will tell you that it was bright sunshine all of the day and all of the night, and it was 25 below. Now, what is significant about our presence there is that we were with the National Science Foundation, because some of the work that goes on and should go on to detect whether the world is getting warmer is going on at the South Pole. It is a marvelous laboratory, for a lot of reasons, but because it is a pristine and unique environment, it offers us opportunities that no other place in the world would offer us.

The ice cap at the South Pole is about 9,600 feet thick and, like the rings of an ancient tree, it is a diary of past geologic happening in the world that impacted that continent prior to the continental drift that occurred that positioned that continent at the South Pole.

The scientists there say, by the reading of that ice cap, that there have been periods of warming and cooling for millions and millions and millions of years, and we are once again, by their estimate, in a period of warming, but we're not sure why. And that, of course, is where the greatest of the debate lies, and that's why this committee hearing is so important.

Not only traveling to the South Pole creates some interesting opportunities, but, in another life, I was a farmer, and I will tell you -- as you know, Mr. Chairman -- that one of the largest costs in our production unit was the cost of fuel and the cost of petrochemicals and the costs of herbicides and insecticides that, in many instances, are the derivatives of petrochemicals.

And because it was a high-cost item, -- and those were in the days of 20- and 30- and 40- and 50-cent diesel fuel -- we were still large consumers, but we became very efficient consumers, and American agriculture has. Even with its tremendous efficiency and the productivity that has resulted, American agriculture still consumes about 12 percent of the diesel fuel utilized in this country.

What does it give to America? It gives it one of the finest food supplies at the least amount of cost per consumer of any nation in the world, and we are rapidly beginning to be the feeders of the world, as we find greater fortune in trade and opportunity in trade, both in raw, unrefined and refined foodstuffs for the country and for the world.

It is foolish, at best, to launch this country and our economy down a path that would, in any way, deter the productivity or the efficiency of American agriculture without strong justifiable reasons, and I believe that what is being proposed by this administration puts this industry and this economy -- the agricultural economy -- at risk.

I am one that would openly say I am willing to place it at risk. Clearly, the sky is falling as a result of the production of greenhouse gases that is created and in irreversible environmental impact. We do not know that. Scientists of all communities differ,

there are bodies of scientists on both sides of this debate, and the debate does on.

And while "The Washington Post" talks about concerns for treaty ratification, "The Economist," a British publication, just last year said if global warming were truly an environmental holocaust in the making, as America's Vice president, Al Gore, must wish he had never said, then, yes, countries should at once lock up their motorcars and shut down their coal plants.

But none of the science points to an inevitable holocaust, still less an imminent one. Guarding against such hazards requires cool weighting of the risks and the benefits, and if global warming is real, but disaster is not imminent, there is much to command a gradual approach to tackling it. I thought that quote was appropriate for what we do here today, because what you're doing, Mr. Chairman, is the gradual approach to understanding.

As well look at the budgets of this administration this year, we will find, tucked here and there to the tune of billions of dollars, new initiatives that lend them toward a treaty yet unratified, and my only challenge to this administration is that if you want to direct the economy of this country and the world to a different outcome, then bring before the Senate the treaty, cause the debate to happen on the issue, and we will debate it and make that decision for the country.

But until such time, we should not put this economy in lockstep through the vehicle of the Clean Air Act or any other law justifiably on the books in search of something not yet decided to be a reality.

So, thank you for this hearing today.

LUGAR: Thank you, very much, Senator Craig. Senator Roberts.

ROBERTS: Thank you, Mr. Chairman. First of all, let me say that I extend my apologies to the former chairman of the committee, in reference to the event -- or the celebration or the unveiling of his portrait -- I know he is no longer here. But, having said that, there is a portrait on the House side of a former chairman, who shall remain nameless, who has his hand extended out and has a rather severe countenance. And I notice that Senator Leahy's has his hands in his own pockets, and he's smiling, which is certainly unique in this town.

And I also wanted to thank him for his support. Without his support, we would have not had a new Farm Bill -- obviously, without the support in the leadership of the distinguished chairman, we wouldn't have had a new Farm Bill -- and, I might add, the most pro-environment Farm Bill ever passed in the Congress. And I wanted to thank him for that.

I was with Senator Craig at the South Pole, with Senator Stevens his CODEL and want to echo his comments, would like to associate myself with his comments.

There were many outstanding scientists doing very viable research there, and the bottom line that I asked was that, at the end of all of this -- with the treaty, with the recommendations by the OECD, with the recommendations of the IPN -- I have an acronym-buster here: Intergovernmental Panel on Climate Change from the U.N., and the OECD is not NATO, it is the Organization Economy, Cooperation and Development. That's an outfit that's been put together to take a look at this by the developed nations. And then we have the actual treaty language.

And I asked this one particular scientist who's in charge of all this, and looking at the ice shelf and worried that, if anybody owns any land in Florida they could be in a world of trouble if, in fact, this keeps up -- and he indicated that, after all this is done, all the regulatory proposals, that we would gain about a half a degree on the global warming issue over a hundred years.

And that indicated something to me that made a lot of sense -- that, over an eight-year period, the cans of freon disappeared and that when American industry figured out that was not the appropriate way for a coolant, that they came up with some substitutes; and that, under a cost-benefit criteria it made sense.

ROBERTS: And his prediction was that it would take American industry and technology and the genius of that all across the world, more especially in Europe, about 10 to 20 years. And so this debate, know, will continue.

I quarrel a little bit with some of my colleagues who say we don't know if we have a problem yet. I think we have a challenge, and I think it's very, serious. How we approach it, it seems to me, is absolutely crucial.

I must say that I have a statement here that I was going to ask one of the witnesses that'll pretty well stand. I think America's farmers and ranchers are very much concerned. They'll be required to undertake mandatory United Nations-prescribed practices to supposedly reduce the greenhouse gas emissions while Central American nations farm on steep hillsides and Southeastern nations continue to burn thousands acres.

The U.S. gets no credit, Mr. Chairman, for the most environmental farmbelt ever, no credit for no-till, no credit for precision agriculture. Instead, they get a situation that simply gives them another poke in the eye, even though our global neighbors ignore their environmentally sound production techniques. That's a little harsh, but that's what's happening in regards to the concern of farm country, and we cannot allow that to happen.

I was in Central America -- pardon me, Latin America, with the majority leader. I was in Guatemala. And we have seen practices on steep hillsides, where they are trying to grow corn in areas where shouldn't grow corn. And the pesticides and the fertilizer flows into the streams, and the crop, or the yield on that crop, is just

you know, worth the effort.

They are trying to go to a more sustainable agriculture, specialty crops. We can export, through precision agriculture, the bulk commodities they need to feed a troubled and hungry nation. They can go to sustainable agriculture, they quit tearing up the rainforests and it's a win-win-win kind of situation.

But we will not do it with the mandatory suggested guidelines and the regulations here that were adopted at Kyoto. From the last page, agriculture is singled out -- we will not do it with the OEC report that gets into all sorts of regulatory schemes, and we sure as heck will not do it with the IPN thing, whatever I've done with it here -- here it is -- which already recommends fuel taxes, energy pricing, regulation of animal density. That's when we go to Dodge City and say, "I'm sorry, you could have only 499 critters in the feed lot." Taxes on fertilizer and ~~limits on the fertilizer use~~ --- that's not going to work.

There are other things that certainly will work, and we will certainly follow up with our responsibilities. As you can tell, I get a little wound up on this. The one thing I'd like to also say is there's about \$5 billion in the administration budget to four federal agencies, maybe five, prior to Senate approval of the treaty. And I understand we want to go ahead with the gradual implementation of the goals, but until the Senate approves the treaty, and until we know, in Argentina, what we're talking about here, I think that it is certainly putting the cart before the horse.

I'm very worried about these protocols, I've asked a lot of questions about it to Carol Browner, other people -- they've been very forthcoming. I'm looking forward to the witnesses.

One last thing: in North Korea, when Senator Stevens and the CODEL went there last spring, we met with several young ladies who were -- and we were told they were about 15 to 16 years old. They were schoolchildren. They looked about 10. I have pictures of them.

Now, the famine is back again in North Korea. It will be there because of the systemic problems we have with agriculture over there -- I say "we" 'cause it's a world obligation -- and hunger and malnutrition in this world is just as important as clean air and clean water and reducing the global warming. And we cannot take production agriculture -- the food and fiber machine that feeds this country in a troubled and hungry world -- and put it at risk in regards to a regulatory scheme that, a hundred years from now, will reduce -- allegedly will reduce the CO2 emissions by one-half of one degree.

We can do better than that, and we need to forge a partnership with American industry and American agriculture in regards to how we treat these things.

I think I've made my remarks, Mr. Chairman. Thank you.

LUGAR: Thank you very much, Senator Roberts. Senator Kerrey.

KERREY: Mr. Chairman, I have a lengthier statement that I'd like to be part made a part ...

LUGAR: It will be placed in the records, Paul.

KERREY: In trying to summarize the statement, Mr. Chairman, first of all, as I understand it, you proposed an inter-agency environmental and security task force ...

LUGAR: Yes.

KERREY: ... which I think is an exceptional idea, and I hope it's an idea that's taken. I think one of the things that's very difficult with global warming, global climate change, is just trying to figure out what's happening.

And I think the facts are overwhelmingly clear that there's something going on here, that there is climate change. And I think the facts are also overwhelmingly clear that no other sector of our economy is going to be adversely affected more than production agriculture, since we produce our product out of doors. So any alteration in a weather pattern could have both a positive, by the way, and a potentially very negative impact upon our capacity to produce food.

And so I'm hopeful that this hearing -- as the previous one that you had on energy pattern and consumption -- will enable us to make good decisions about how to influence this whole process. And I know that there's going to be further negotiations, for example, going in Buenos Aires in November, where the issue of sinks and measurement is going to be discussed.

And regardless of how a person's going to vote on the treaty, it seems to me that one of the things that we ought to try to do is influence, as constructively as possible, the deliberations of the that treaty so as whatever comes back comes back in a fashion that enables production agriculture to prosper.

The fundamental challenge at that -- and you framed it, actually, quite well in the earlier hearing that we had on energy, is that the population of the earth is going to go from 6.3 to nine billion over the next 50 or 60 years, depending upon how fast you think the earth is going to grow, and there's going to be a doubling of food supply needs. The demand for food is going to increase, and it's likely to be that we're not going to expand the acreages. It's apt to be that we're going to be producing that food on smaller amounts of acres. And in order to produce anything, you need energy.

It used to be we produced it all with human energy, and then we some animals to help us, and we've increasingly added more and more energy, and we've gotten more and more efficient, and we have also -- since the cost of energy went up -- we've seen significant

ons taken on the part of production agriculture to reduce their own energy consumption, because it's a cost.

Nonetheless, to produce all that food, some energy's going to be required, so it seems to me we've got this potential train wreck going on here, with consumption of energy increasing greenhouse gas emissions, producing potential for climate change at the same time that we've got increased demands for the product that's going to require additional energy consumption.

And so the more thoughtful we can be and deliberative that we can be on this issue, I think the more likely it is that we'll be remembered out there in the future as people that did resolve these issues, that did alter our behavior where necessary in order to be able to avoid a catastrophic problem.

And so I very much appreciate your thoughtful approach to this subject, and I think this inter-agency group that you're proposing -- especially given some of the things that we're seeing in the current budget. I've got to say it doesn't make much sense to me, if global warming and global climate change is a problem, to be cutting the formula funds for agricultural research by nine percent while doubling the research money for NIH. I mean, this is the area where we're apt to find the answer to not only production problems but energy efficiency problems that we've got.

So one of the things that I think we've got to do is come, as you've indicated, in a very thoughtful way, but in an aggressive way to make certain that not only is agriculture interests taken care of in the short term, but, in the long term, we're able to solve these two very big problems simultaneously.

LUGAR: Well, thank you very much, Senator Kerrey. Let me just mention -- picking up on your comments and those of Senator Grassley, Roberts and Craig -- as you know, our committee heard testimony that the population of the world would increase about 50 percent in a 50-year period of time, that demand for food would increase by three times in that period, and the number of arable acres on the earth that are productive would not increase; and that one result of our failure to increase yields by three times would be the cutting-down of the forests of this world, an ecological disaster. So the situation is very much related to what we're talking about now.

On the one hand, we're talking about how we get more forests and the sink effect and the measurements. On the other hand, this committee considered carefully last year a comprehensive research bill not only for our basic land grant colleges and community colleges, Indian reservations, but a very far-reaching creative challenge to the very best minds in the world, in a five-year period of time, for more pure research than we have had in agriculture.

That bill passed the Senate, ultimately unanimously, after members really came together in a collegial way, and it's in conference in the House, and we're hopeful for results there, but we

and from our own USDA as well as some outside witnesses, that the increase in yields in wheat have not been great in the last 10 years -- in fact suspect (ph) and likewise beans not too much better, corn only slightly better -- that this isn't going to happen all by itself.

So the constructive efforts that we're talking about here with regard to forests and yields, productive agriculture really relate to what Senator Roberts talked about famine currently, which we see in the world, and which we will see a lot more of without breakthroughs of this sort.

And I appreciate your correlating these things, because I think they are all a part of a package, that you really cannot talk about the environment, or even global warming, without some thought as to how famine is to be met, how forests are to be increased, how, in essence, these things mesh together, and this is why I hope we'll have an inter-agency view.

Senator Santorum, do you have an opening comment?

SANTORUM: In the interests of time, I'll be brief. I do have a written statement, and just from sitting back and listening, I agree with a lot of what I've heard said.

I just see a situation where we're not sure what the problem is, we seem to be sure about what the solution to a problem we don't what is, which is somewhat troubling to me, that we seem -- that we must move forward, and there's such pressure to move forward when we're not sure whether we're going to create more problems by the solution than we have by -- with this, at least uncertain, problem before us of global warming.

Pick any issue. That's not a good way to legislate, it's not a good way to conduct policy. It's just -- we have to have a better understanding of the nature of the problem and a better consensus -- I don't think we have that -- and then we also have to understand what the consequences of our action.

I think the chairman is right when it comes to famine or it comes to deforestation or it comes to just the slowing of the overall economy of this country and the impact of that on health and other things -- the economy, in general.

So I have some very concerns about this. I do have concerns about this administration's sort of seeing this as some sort of holy grail that they must achieve with little -- in my mind, little -- thought as to what all of these repercussions could be. And, as Senator Roberts said to eloquently, what little gain to be made in a problem we're not sure of. It just doesn't seem like a good way to run a railroad.

LUGAR: Thank you very much, Senator Santorum. The chair will conclude this period of senatorial comment by including in the record

Letter written to president Clinton by the majority leader, Trent Lott, Senator Helms, the chairman of the Foreign Relations Committee, and Senator Hagel, who is the Senate climate change observer group chairman on March 3, 1998.

This comes after a hearing in the Foreign Relations Committee on February 11 of this year, and during that time, Senator Hagel asked Secretary Eizenstat -- who'll be what this morning -- "May I ask -- this means the administration will not go forward in trying to implement any dynamic of this Kyoto treaty through regulation, budget fiat, executive order, until, as you suggest, it is brought before the U.S. Senate?"

And Secretary Eizenstat is quoted -- at least in the Foreign Relations Committee hearing record -- by saying, "Yes, sir. We have no intention -- through the back door or anything else -- without Senate confirmation, of trying to impose or take any steps to impose what would be a binding restriction on our companies, on our industry, on our businesses, on our agriculture, on commerce, on our country until and unless the Senate of the United States says so."

And the senators therefore conclude, as they write to the president, "We were pleased to hear Ambassador Eizenstat assure the committee and the Senate the administration would take no steps to implement the treaty by executive authority or other back-door methods or circumventing the United States Senate."

I include that as a part of the record, and, at this point, I would like to introduce the distinguished panel of administration witnesses, and I ask them to come forward: the Honorable Stuart Eizenstat, Undersecretary of State for Economic, Business and Agricultural Affairs of the United States Department of State; the Honorable Richard Rominger, Deputy Secretary of the United States Department of Agriculture; and the Honorable Janet L. Yellen, Chairperson of the president's Council of Economic Advisers.

CRAIG: Mr. Chairman ...

LUGAR: Senator Craig.

CRAIG: Before they start, let me ask you now to consent that my full statement become part of the record.

LUGAR: It will be placed in the record, and that will be true of each senator's statements as they are made available to the chair.

We are honored that you are here today, (unintelligible). Let me ask that the testimony come in the order of introduction, namely, Secretary Eizenstat, first of all, then Mr. Rominger and then Miss Yellen. Secretary Eizenstat, would you give us your testimony?

EIZENSTAT: Thank you, Mr. Chairman. I appreciate the opportunity to appear before you, and I appreciate the statements that were made by you and your colleagues. I'd like, if I may, to divide

testimony into four parts, and I ask that the full testimony be made part of the record.

LUGAR: It will be placed in the record in full.

EIZENSTAT: First, the science. Second, key features of the protocol. Third, efforts to correct some misperceptions, and, fourth, a brief review of the president's own climate change technology initiative.

First, with respect to the science. There is a, I believe, consensus that human beings are, in fact, changing the climate by increasing the global concentrations of greenhouse gases. Over the last century, greenhouse gases have been released to the atmosphere far faster than natural processes can remove them.

There is no ambiguity in the data. In this first chart to my right, taken from core samplings as well as from the heights in Hawaii, it clearly dramatizes the concentrations of greenhouse gases that have grown by some 30 percent, especially since 1960. You can see the increasing slope of these concentrations in the orange from 1960 to the present date. That slope will increase and continue to increase dramatically.

The authoritative Intergovernmental Panel on Climate Change, representing the work of more than 2,000 of the world's leading climate change scientists from more than 50 countries concluded, at the end of 1995, a number of important things. First, that under a business-as-usual environment, concentrations of greenhouse gases could exceed levels not seen on the planet for 50 million years. The projected temperature increase of two to six and a half degrees over the next 100 years could exceed rates of change not seen for the last 10,000 years.

The second chart is a projection which demonstrates something that models and computer simulations have indicated for a very long time, and that is that there is a direct correlation between the build-up in CO₂ and other greenhouse gases which demonstrable from actual core samples and measurements and, in turn, the rise in temperatures. There has already been indicated that the earth has already warmed about one degree Fahrenheit over the last century and, again, the balance of evidence suggests that there is a discernible human influence in this respect.

Increased temperatures are expected to speed up the global water cycle, lead to a drying of soils and, in some areas, increased drought. Sea levels are expected to rise between six and 37 inches over the next century, and global mean sea levels have already risen, Mr. Chairman and members of the committee, by four to 10 inches over the last 100 years, mainly because water expands when heated.

The melting of glaciers which has occurred worldwide and is, in, measurable, also contributes to this rise in sea levels. Formerly frozen soils, permafrost in the Alaskan and Siberian Arctic

also begun to melt. This is, again, demonstrable, and has been demonstrated by scientists. That damages by ecosystems and infrastructures and will also lead to a decay of organic matter and the release of trapped carbon and methane, creating an additional source of greenhouse gases.

A 20-inch sea level rise could double the global population at risk from storm surges at low-lying areas, for example, coastal Louisiana and the Florida Everglades. This would also affect human health, was exacerbate the number of cases of malaria, in particular.

Only a few days ago, we saw executives from major oil companies. We indicated that they recognized that climate change is, in effect, occurring and that its consequences need to be considered.

Mr. Chairman and members of the committee, we consider Kyoto to be what I would call an insurance policy against the potentially devastating and irreversible impacts of global warming. If we act now, the premium on that policy will be reasonable and must less costly than if we delay and hope that the problem created by greenhouse gases will somehow go away. It's much like a life insurance policy -- the cost of premiums grow if we wait to insure ourselves until we're much older.

But, in the case of global warming, we won't have a second chance. Failure to act could lead to irreversible consequences, and we would be committing ourselves, our children and our grandchildren to a very different planet, and they'll never forgive us.

Second, the protocol itself. It is an important achievement, but it is a framework for action, a work in progress, and not a finished product. There were three major objectives that the president and Vice president asked us to negotiate. We achieved the first two and made some progress -- though clearly not enough -- on the third.

Our first objective was developing realistic targets and timetables among developed countries. Here we secured key elements of the president's proposal. The U.S. concept of multi-year timeframes for emissions reductions was selected, rather than a fixed, single-year target. This will allow our industries much greater flexibility to meet their targets. In addition, the timeframe 2008 to 2012 was the U.S. timeframe, not the early periods preferred by the European Union, Japan and others. This will also cushion the transition effect on agriculture, business, and workers.

We also got the concept of differentiated targets for key industrial powers so that, for example, our competitors are taking on similar and, in some cases -- for example, the European Union -- even deeper obligations than are we.

When changes in the accounting rules for gases and offsets for so-called "sinks," which I'll describe in a minute, that absorb carbon dioxide are factored in, the actual level of effort required by the United States is very close to the president's original proposal to

turn or stabilize emissions to 1990 by 2008 to 2012, representing, at most, a three-percent real reduction below that proposal and perhaps less.

Another thing that we accomplished at Kyoto, in addition, was an innovative proposal that we helped shape which allows activities like planting trees and good forest products and practices that Senator Wyden and Senator Gordon mentioned that absorb carbon dioxide, called sinks, to be used to offset the emission requirements that industry would otherwise have to make. This is a significant way of reducing costs and burdens and will be of particular benefit to the United States because of our good forest practices.

Also, we achieved in Kyoto the coverage of all six greenhouse gases, a distinct benefit to us, even though the European Union and Japan fought until the last moment to cover only three.

Our second objective set by the president and vice president was to make that the countries could meet their obligations by flexible market mechanisms -- this is something, for example, that William Buckley, Jr. has noted in one of his articles -- rather than mandatory policies and measures.

And Senator Roberts, you mentioned concern about mandatory taxes and mandatory regulations. What we really achieved in Kyoto is flexible market mechanisms.

If the European Union wants to impose a tax on themselves, if they want to regulate themselves top down, let them to do it. We avoided the requirement of so-called "harmonized policies" and we rely on flexible market mechanisms which are deeply embedded in Kyoto. It enshrines a centerpiece of this market-based approach and that is the opportunity for our companies and other countries to trade in emissions permits. In this way, companies or countries can purchase less expensive emissions permits from other companies or countries that have more than they need. This is not only economically sensible, but environmentally sound.

We've had a very positive experience with permit-trading in our own acid rain program which has reduced costs by 50 percent from what was expected. So the inclusion of these market-based mechanisms, and the right to trade in the open market, was a signal victory for the United States.

Let me very clear. The commitment we made in Kyoto would not have been made, could not have been made were it not for the flexibility that these mechanisms give us that were also agreed to. Until we're satisfied with the rules and procedures yet to be established, the promise of Kyoto will never be realized.

Our third objective was to secure meaningful participation of key developing countries. This is obviously a concern, as, Mr. Chairman, mentioned in the Hagel-Byrd resolution. After all, global warming is a global problem, it requires a global solution. By 2025 -- some

2035, some say 2015 -- but in the next century, certainly before the midpoint, the developed world will be emitting less greenhouse gases, and the developing world more than the total of the developed world.

We frankly encountered significant resistance in Kyoto by some developing countries to meaningful participation in solving this problem, yet, still, developing countries may, as a prerequisite for engaging in emissions trading, voluntarily assume binding emissions targets through amendment to the annex of the protocol that lists countries with targets.

Let me very clear. The Kyoto agreement does not meet our requirements for developing country participation. Nonetheless, even here we made a significant down payment in the form of a provision advanced by Brazil and strongly backed by the United States, called a "clean development mechanism," ~~which fully embraces the U.S. concept of joint implementation with credits.~~

This will build a bridge between -- through incentives -- the developed countries and the developing countries. It allows companies in the United States and elsewhere in the developed world to invest in projects abroad -- it could be a power plant, it could be a forestation project -- and get credits for it against our own emissions targets, again lowering the burden on U.N. industry by allowing this kind of participation. Our companies can either invest or simply purchase the permits.

In determining what developed countries ought to do, we have to be aware, of course, that their circumstances differ. Just as we suggested differentiated approaches to the developed world, so too we should for the developing world. No one approach to meaningful participation is unlikely prevail.

EIZENSTAT: A third broad point is to correct a few misperceptions, and here I'll be brief, because there are several and I only want to focus on one or two.

The first is that somehow Kyoto will impair the ability of our military to meet its worldwide responsibilities. That is absolutely untrue. We took special pains, working with the Defense Department and with our uniformed military -- and I had a representative of the joint chiefs of staff with me -- to fully protect the unique position of the U.S. as the world's only superpower with global military responsibilities. We achieved everything we were asked to by the Defense Department and the military to protect military operations and our national security.

For example, the parties at Kyoto took a decision to exempt key overseas military activities from any emissions targets, including exemptions for bunker fuels used in international aviation and time transport and from emissions resulting from multilateral operations, including self defense, peacekeeping and humanitarian relief.

It's important to also recognize, Mr. Chairman and members of the Committee, that this exempts from our national targets not only multilateral operations expressly authorized by the Security Council -- such as Desert Storm or Bosnia -- but, importantly, it also would exempt multilateral operations that the U.S. initiates pursuant to the U.N. charter without express authorization, such as Grenada.

As Secretary of Defense Cohen recently wrote, "Based on achieving our international objectives, the Department Defense is fully satisfied with the Kyoto results."

A second misperception is that somehow the protocol is going to create a super U.N. Secretariat that will intrude on U.S. sovereignty through intrusive verification procedures. This is, again, not so.

The review process in the protocol largely codifies already existing practices under the 1992 Rio Convention. The review process is not by some secretariat, it's by experts nominated by governments. The review teams meet with government officials, they come here to the Congress. They meet with people by invitation.

Site visits can occur -- and I want to stress this -- only if they are invited by the United States government and, on private property, only if the owner of that private property, whether it's a plant or a farm, invites them on. There are no helicopters swooping down on the U.S., coming into farmland uninvited.

We will not accept, nor do we anticipate an approach which require the U.N. Secretariat to give prior approval of individual emissions trading. Trading will be done between interested nations and their companies on a market-based system.

Let me close by talking about where we go from here. First, rules and procedures have to be adopted for emissions trading, joint implementation, the clean development mechanism to assure they operate efficiently and smoothly. I'll be working, and our whole team will, very closely with industry and agriculture to be sure they are satisfied with the emissions trading system we develop is efficient and effective.

We also have to work to assure meaningful participation of key developing countries, and we're planning a full court diplomatic press to bring developing nations into this meaningful role. We'll accept nothing less, nor will we expect the U.S. Senate to accept anything less. The U.S. should not assume binding obligations under the protocol until key developing countries meaningfully participate in meeting the challenge of climate change.

It obviously would, therefore, be premature to submit something to the Senate which the Senate has asked for this kind of participation as a precondition and which we have not achieved. This is a great obligation. It may take months, it may take years, but we will work on it.

Further, let me say that to lock in the progress we have made in terms of developed countries -- all the flexible market mechanisms and the like -- we would anticipate signing the protocol within the one-year period provided for in the agreement between the middle of March of this year and the middle of March of 1999. We have not as yet determined the precise timing, due to tactical considerations, but we will sign at a time that makes the most sense in terms of our overall diplomatic situation.

And last, the president suggested a down payment. This is voluntary -- it will require the consent, of course, of the Congress -- and that is a \$6.3 billion technology initiative over five years to cut greenhouse gas emissions. It'll mean tax cuts, combined with R&D incentives, to take cost-effective, practical steps to help us be ready for the challenge in the next century. We are committed to work with your committee and with the Congress to craft our ongoing approach.

But in conclusion, we must not ignore what science is telling us. We ought to purchase this as a kind of insurance policy that we can afford, that's prudent and that, if we fail to act, if we fail to recognize what scientists are telling us, it'll be infinitely more costly to do so in the future.

Thank you very much for your attention.

LUGAR: Thank you very much, Secretary Eizenstat, for a very thoughtful and comprehensive statement. The chair would like to recognize now another good friend of our committee from frequent appearances, and we're always grateful to have you, Richard -- Secretary Rominger.

ROMINGER: Thank you, Mr. Chairman, members of the committee. I welcome the opportunity to discuss the implications of global climate change and Kyoto Protocol for U.S. agriculture and forests. I would request that a copy of my full statement be entered in the record, and I will summarize.

LUGAR: It will be placed in full in the record.

ROMINGER: Climate is a major determinant of agricultural productivity, defining to a large extent where crops and forests are grown. Weather aberrations can cause significant losses from agriculture and forests, and can place a heavy burden on natural resources in the environment.

While the effect climate change on agriculture have been estimated to be small in the aggregate for major crops, regional impacts could be quite large and could be accompanied by significant increases in weather and yield variability.

The most recent work shows that doubling CO2 levels would result a change in the world cereal production in the order of plus one or minus one percent, assuming that farmers and markets adjust to the

ing climate. Without adaptation, cereal production could fall an estimated 18 to 29 percent.

For the United States, recent studies show that impacts ranging from plus \$6 billion to minus \$11 billion per year, with the southern states tending to suffer from dryer conditions while northern regions gain from longer growing seasons.

The effect on forests may be more significant than for agriculture, in part because effective climate adaptation is less possible due to longer growing cycles. Major displacements of current forest locations are projected, although there remains much uncertainty as to how fast climate will change and how that will shape the regional impacts.

Under the Kyoto Protocol, the United States would be required to reduce greenhouse gas emissions, as Secretary Eizenstat has said. Based on the administration's initial estimates of an increase in energy prices of three to five percent -- which excludes the positive effects of electricity deregulation -- the likely impact on U.S. agriculture would be modest.

USDA plans to provide the committee with a more complete analysis of the effects of the Kyoto Protocol on U.S. agriculture. The protocol allows for a number of methods to lower the cost of achieving the targeted levels of greenhouse gas emissions. These include flexibility in what gases are reduced, credit for actions that sequester carbon, international trading of emissions, joint implementation and the clean development mechanism.

Costs can also be reduced with meaningful developing country participation, with electric power deregulation and various actions that improve technology and conserve energy. In my written statement, I illustrate some of the types of opportunities for U.S. agriculture that are likely to be generated by the protocol's flexible approach to reducing greenhouse gas emissions, notably carbon sequestration in forests and soils, and the production of biomass as a substitute for fossil fuels.

USDA's current annual spending for climate change research is \$58 million. This supports a variety of research initiatives across many program areas, including the Forest Service, National Resources Conservation Service, the Agricultural Research Service, and Cooperative State Research and Extension Service, and the Economic Research Service.

USDA's FY '99 budget proposal request an additional \$10 million for climate change research, of which \$6 million is for biomass research. While USDA has done work over the years on biomass, much of it has been financed by the Department of Energy's ambitious program. The focus of USDA's initiative -- developing partnership with DOE -- will be on improving the productivity of biomass crops such the hardy grasses and fast-growing trees, and on harvesting and processing systems and conversion of cellulosic material to fuels.

The enormous risks posed by climate change and the substantial challenge presented by Kyoto make it clear that USDA should escalate its level of activity in the area of global climate change. Consequently, the department will soon advise the House and Senate Appropriations Committees that we are reorganizing our Global Change Program office, and the new office will be located under the office of our chief economist, Keith Collins, and that office reports directly to the secretary and to me.

The new director of that office will be Dr. Margo Anderson, a prominent national resource economist. The office will be responsible for coordinating a wide range of climate change activities across the department, supporting the activities of the executive branch, and working with agricultural and rural communities to help them address the challenges of climate change and to realize the opportunities that Kyoto will present.

So our goal is to insure U.S. agricultural is well represented in climate change activities, both within and outside the government, and we will work closely with you, Mr. Chairman and members of the committee and your staffs, on this important issue.

That completes my testimony.

LUGAR: Thank you very much, Secretary Rominger. The chair would like to recognize now the Honorable Janet Yellen, chairperson of the Council on Economic Advisers. Welcome to the committee.

YELLEN: Thank you, Mr. Chairman, members of the committee. I'd like to summarize my full statement and ask that it be included in the record.

LUGAR: It will be placed in full in the record.

YELLEN: The president has said that we can work to avert the grave dangers of climate change while, at the same time, maintaining the strength of our economy. I agree, and I'm pleased to have this opportunity to appear before the committee to elaborate on the administration's views on these issues.

The international agreement that was reached in Kyoto this past December is a crucial step forward -- the addressing global climate change -- but it's only one step in a long journey. Since the international effort to reduce greenhouse gas emissions is still, in some respects, a work in progress, it's not yet possible to provide a full, authoritative analysis of it.

But in my testimony today, I will attempt to identify key elements of the agreement and the administration's policy, such as international emissions permit-trading, meaningful developing country participation, the inclusion of land-use activities that absorb carbon, namely sinks, and six categories of gases, as well as domestic initiatives that can insure that reduction in global greenhouse gas emissions are consistent with continued strong economic growth.

The Intergovernmental Panel on Climate Change, the IPCC, jointly established by the World Meteorological Organization and the United Nations Environment Program, concluded in 1995 that the balance of evidence suggests that there is a discernible human influence on global climate. Current concentrations of carbon dioxide, methane, nitrous oxide and the other so-called greenhouse gases, as Ambassador Eizenstat has described, have reached levels well above those of preindustrial times.

As a result of the increased concentration of greenhouse gases, the IPCC estimates the global temperatures will increase by between two to six degree Fahrenheit in the next 100 years, with the best guess of about three and a half degrees Fahrenheit.

The IPCC reports that a doubling of carbon dioxide levels would lead to approximately 10,000 additional deaths per year for the current U.S. population from ~~higher summer temperatures~~, even after netting out the effects of warmer winters and acclimatization. The IPCC also predicts sea level increases of about 20 inches by 2100, with greater increases in subsequent years.

Now, despite the difficulties of deriving quantitative assessments of the damages from climate change, researchers have nonetheless developed monetary estimates of damages that prompt substantial concern and range in the tens of billions of dollars per year for temperature changes that are projected to occur in the next century.

So, if left uncontrolled, disruption of the earth's climate may pose substantial costs in terms of harm to commerce and to the environment alike. These costs -- and they are significant -- provide the primary motivation for actions to reduce greenhouse gas emissions.

Those estimates do not and cannot accurately reflect the value of reducing the unknown risk of large-scale and potentially irreversible events with potentially catastrophic consequences, such as the warming of the northern tundra sufficient to release very large amounts of methane from the permafrost and thereby leading to accelerated warming. There is thus a strong argument for the Kyoto Protocol as a form of insurance against a serious environmental threat.

So, to address climate change, the United States and approximately 160 other nations, agreed in the negotiations held in Kyoto last December, to reduce emissions of greenhouse gases. The Kyoto Protocol, which requires the advice and consent of the Senate, would place binding limits on each industrial country's combined emissions of the six principal categories of greenhouse gases, and those limits apply to the 38 so-called Annex 1 countries, which are the industrialized countries, defined to include Russia, Ukraine and most Eastern European countries.

In taking action to reduce emissions, economic analysis suggests that two elements are absolutely essential. The effort must be

flexible and market-based to insure that we reduce emissions in the most efficient way, and the effort must be global, for without global emissions reductions, the effort would be ineffective.

The nature of the climate change problem -- that greenhouse gas emissions have the same effect on the climate regardless of how, where and, within limits, when they occur -- suggests three basic approaches to lower the cost of achieving given levels of environmental protection. We term these when, what and where flexibility.

As a result of U.S. diplomatic efforts, all three forms of flexibility are broadly reflected in the Kyoto Protocol. The choice of a multi-year budget period, ending later than many countries proposed, with allowance for banking of emissions reductions constitute key elements of when flexibility. These provisions mitigate costs by permitting reductions at times when they are less, rather than more, costly.

The inclusion of all six greenhouse gases and certain sink activities that promote removal of carbon from the atmosphere provide substantial what flexibility. The U.S. succeeded in having the Kyoto Protocol stipulate that countries with binding targets are to reduce total greenhouse gas emissions by certain percentages, but it does not require specific reductions for specific gases. Moreover, sinks can be used to offset emissions targets.

The inclusion of international emissions trading among countries that take on binding targets, coupled with an agreement allowing industrial countries to receive emissions reduction credit for certified investments in clean development in the developing world are the critical forms of where flexibility incorporated in the Kyoto Protocol. Although details of these provision need to be finalized in negotiations in Buenos Aires later this year, we believe that these mechanisms can provide substantial reductions in costs of attaining our environmental objectives.

The problem of climate change is global and so it requires a global solution. Around 2030, under a continuation of "business as usual," a majority of world emissions are project to come from developing countries, so without developing country participation, we cannot achieve adequate climate protection.

In addition, developing country participation would permit relatively low-cost emissions reductions to be internationally recognized as a substitute for more extensive reductions in many industrial countries. The president has made clear that he will not submit the Kyoto Protocol to the Senate without meaningful participation from key developing countries who are not included in Annex 1.

An economic analysis of climate change faces three broad categories of difficulties. First are the uncertainties that still remain over the terms of the ultimate treaty. Second are the inherent

...tations of available models to analyze even short-term costs and benefits. And, finally, is the impossibility of putting a single monetary figure on the long-term benefits of climate change mitigation.

Mindful of the limitations of any single model as a tool for evaluating the economic impact of the Kyoto Protocol, we've employed a broad array of techniques to assess the various possible costs and non-climate benefits of the administration's emissions reduction policy.

Now, ignoring the benefits of mitigating climate change itself, our conclusion is that the net costs of our policies to reduce emissions are likely to be small if those reductions are undertaken in an efficient manner and we're successful in securing meaningful developing country participation as well as effective international trading in clean development mechanisms in future negotiations. As I explain in my written testimony, this conclusion is not entirely dependent on, but is fully consistent with, formal model results.

For example, given the factors such as trading that I've just delineated, but excluding the benefits of acting and also excluding the impact of electricity restructuring, estimates derived using the Kells (ph) second generation model suggest that the resource costs of attaining the Kyoto targets for emissions reductions might amount to just seven to twelve billion dollars per year in 2008 to 2012, or just one-tenth of a percent of projected gross domestic product. That small premium, in effect, purchases a partial insurance policy against a serious environmental threat.

A comprehensive economic evaluation of the administration's climate change policies must also take into account the potential payoffs from the full package of proposed administration climate change initiatives. As you know, the president's fiscal year '99 budget includes a \$6.3 billion package of tax cuts and R&D over the next five years. This package makes good sense in terms of energy policy and will jumpstart our efforts.

A second responsible step entails industry-by-industry consultations to prepare emission-reduction plans in key industrial sectors. And a final component of the president's climate change policy is his support for electricity restructuring in a manner that is expected to offer approximately \$20 billion in cost savings to electricity consumers, while offering modest reductions in greenhouse gas emissions.

I look forward to continuing to work with members of this committee as well as other interested parties in further analyzing the Kyoto Protocol and evaluating the effects of reducing greenhouse gas emissions. Thank you.

LUGAR: Thank you very much, Miss Yellen. The chair would like to recognize now the distinguished ranking member, Senator Harkin, for opening comments that he may have.

HARKIN: Well, Mr. Chairman, thank you, and again, I apologize to you and to our witnesses and other members of the committee for being a little late. Speaking of climate change, I was giving an address at the U.S. Hydrogen Association about the prospects of using hydrogen as a key energy source for the next century, so kind of apropos of what we're talking about here.

I really don't -- I have statement. I'd just like to make it a part of the record, Mr. Chairman.

LUGAR: It will be entered in full.

HARKIN: Just a couple of points that I'd like to make. In terms of agriculture, doing nothing may be the worst thing of all that we could do for agriculture. Under what's happening now, variables in the climate change may be just disastrous for agriculture, so doing nothing may be the worst thing of all.

Secondly, our farmers have demonstrated a unique ability in the past to adopt energy-saving practices. A recent USDA study -- and maybe someone mentioned this -- indicated that agriculture output per unit of energy input increased by almost 50 percent between '78 and '91, so it seems to me that farmers can lead the way in showing how efficient they can become in utilizing energy.

Secondly, the best places to store carbon are in soils and plants, especially in our perennials. And so, since U.S. farmers control more than a billion acres of cropland and pasture, our farmers are well-positioned to benefit for a carbon trading system by undertaking carbon sequestration efforts, and we shouldn't forget about that as another possible source of income to our farmers.

Now, the third point I'd make is that the greater production and use of renewable energy is increasing in this country, and farmers can play a big part in that in utilizing biomass. Mr. Chairman, we have a project in Iowa going on right now where farmers are planting thousands of acres in switchgrass. That switchgrass is actually being burned in IES utility plant in Ottumwa (ph) with coal. And, of course, switchgrass just grows every year, you don't have to much fertilizer, and it's a great carbon sink, so we might get a lot of bounces off of this thing in the future.

So I don't think that we ought to look at the possibility of whatever the administration sends us and whatever is finally agreed upon in terms of a treaty as being necessarily bad for agriculture. It may hold some very good opportunities for farmers to even make more money and to be more productive and to use our vast resources in conservation as a carbon sink, if, in fact, we're going to get into that kind of a system.

Thank you very much, Mr. Chairman.

LUGAR: Thank you very much, Senator Harkin. Let me ask, first of all -- just clarification. Miss Yellen, in your statement, you

quite a bit of economic analysis, but you mention an economic analysis maybe beyond that that is more comprehensive, and, if that exists, could that be made a part of our record?

YELLEN: The economic analysis we have is in my testimony. There is no additional economic analysis.

LUGAR: Well, I'm glad to clarify that. Let me ask, first of all, Secretary Eizenstat -- you have mentioned, as has Secretary Rominger, that two and a half to six degrees Fahrenheit change might occur in the next 100 years, and indicated that there is considerable scientific consensus for that. Would you give us your testimony on how strong that consensus is?

And the reason I ask that question is that, as you are well aware, having negotiated this, having heard from a lot of scientists, the committee and the public as a whole have heard various estimates from there being inconsequential change to at least the thought that if there is to be a change, it's nature-based as opposed to human-motivated. Give us your idea or that of the administration as to how solid this consensus of science is.

EIZENSTAT: How we think the consensus is increasingly solid and that it was exemplified by the 1990 FAV (ph) report of the Intergovernmental Panel on Climate Change, which had 2,000 scientists from 50 countries. And they were very careful not to try to overstate, not to be hyperbolic, but to come to a cool scientific conclusion, and that was that the balance of evidence is that human conduct is adding to the build-up of gases, and, therefore, to the increase temperatures.

And the models that they used, which are accepted models, indicate that already we've had a one-degree increase in temperature over the last hundred years, starting, basically, with the Industrial Revolution, and the computer simulations indicate a very close relationship between absolutely scientific-based -- based on core data -- carbon buildups and temperature increases. Their best guess, as scientists, was that this would mean a warming of about 3.5 degrees Fahrenheit by the end of the next century. So we think that there is a strong consensus on that.

Also, over the last decade, we have had some of the most substantial increases in temperature. I think that nine of the last 11 years, culminating in 1997, which is the warmest, are among the warmest years we've had in this entire century. So I think that there is an increasing elements of that, and the measurements are all consistent with this.

LUGAR: Now, you've taken into consideration -- and by that I mean the sign of a community, this up-and-down of warming and cooling that was described, as I recall, by Senator Craig, or those who have been to the South Pole and examined the ice cores there. In other words, is this something that is unique for our times, or, as we look back through thousands of years, have these variations occurred

uently?

EIZENSTAT: I think the senator was certainly correct that there have been periods, but the levels of concentration here are so much greater than anything we've seen for literally 50 million years in terms of the concentrations.

These core samplings, which go back and do provide, in effect like fossils, an example of the buildups going back to almost the beginning of the planet, indicate that the degree of buildup is so substantial and so unprecedented, and if the modeling -- which has been the case -- that that buildup is matched by temperature increases, one would have to say that this is consistent, that it is not simply a temporal issue that will go away, and that as we keep building up these greenhouse emissions we get more and more, that the temperature increase will continue to grow.

And that's why we have urged action now, before the situation gets out of hand.

LUGAR: Now, a large part of the administration's strategy for complying with the protocol would be emission reduction purchases from other countries. What kind of transfer of wealth would be involved in these exchanges, and how practical is it to anticipate that as large a percentage of the reduction -- at least, in our obligation -- could actually be obtained from these countries?

EIZENSTAT: Well, there are two types of trading that are really permitted. The first is trading among industrial countries -- the so-called Annex 1 country -- and the second is the trading that would occur under the clean development mechanism with developing countries.

A very significant percentage of our obligation could be met by that emissions trading, and this makes both economic and environmental sense, because a ton of emissions reduced anywhere is a ton less in the atmosphere. And if a farmer in Indiana or a utility in Iowa or in Nebraska can reduce their burden by purchasing credits at a cheaper level, they should be allowed to do so in an unfettered way.

LUGAR: How much would it cost this farmer in Indiana to buy a ton, let's say, of relief from Russia?

EIZENSTAT: Well, it's impossible to say, because it'll be determined by market forces. It'll literally be a question of supply and demand. Now, Chairman Yellen's own figures indicate it'll be somewhere in the range of \$14 to \$23 a ton. She may want to elaborate on that, but ...

LUGAR: How many tons would we need to buy?

EIZENSTAT: Well, in terms of this amount, we can't quantify the amount that we would actually have to be able to buy to meet our targets, but this is something that will depend on measurements and on the actual implementation of the agreement. We don't have a precise

re on the number of tons that would have to be purchased.

LUGAR: Well, would it be several billion dollars a year? In other words, I'm trying to get an idea ...

EIZENSTAT: Yes, It would be several billion dollars a year.

LUGAR: Of transfer of wealth from this country to other countries by the credits to be in compliance.

EIZENSTAT: Well, in a sense, a transfer of wealth. I mean, it is a way of reducing our own burden from what we otherwise would have to impose on our own companies.

LUGAR: If we adopt the treaty, but -- absent that, you don't have the cost, but if you have the treaty, you have an obligation ...

EIZENSTAT: And, absent the treaty, you do have costs. You have the huge costs, which Chairman Yellen has indicated, in terms of additional health risks and the like.

LUGAR: Now, let me ask, finally, of you, Secretary Eizenstat -- you have been an international observer for a long time, even prior to these negotiations. As you take a look at the negotiators from China and India -- to take two prime examples at Kyoto -- is there any practical reason to suspect that they're going to be amenable to cooperation in the intermediate future? It occurred to me that their positions are rather adamant.

EIZENSTAT: There's no question but that we have a significant education job to do and that they were very adamant at Kyoto. At the same time, there are a number of developing countries -- Argentina's an example, Mexico -- that were actually anxious to be able to participate.

Our notion is that you can't have one approach for all developing countries. What may be relevant for Israel or Singapore, which have high per capita incomes, or for countries like South Korea and Mexico, which are in the OECD and therefore in the industrial club, or Argentina that wishes to join it, may be very different than a Bangladesh.

With respect to China and India, they are obviously key. China will be the largest emitter, although obviously not on a per capita basis, around the year 2010 to 2015, so their participation is crucial, but the degree of their participation and how they should participate is something we're working on now.

We already have a bilateral environmental agreement with them, and under that framework, we're hopeful that they will adopt good energy policies -- de-subsidization, deregulation -- things that make their participation meaningful. There may be other binding obligations that they take on, and what we've suggested to developing countries, Senator, such as China, is that they may not have to take

binding limitations that actually cut their level of growth, but rather that decrease the level of their increase, so that you're dealing with an energy efficiency quotient, but you're still getting binding commitments.

So we have a variety of approaches that we're going to look at, and we're working -- not just ourselves, but, for example, only two weeks ago in London when I met with the G8, there is an increasing interest in the European Union and Japan and Australia and a whole range of countries -- Canada -- to join with us to try to get this meaningful participation, because they realize it is, in fact, a global problem.

LUGAR: In former administrations' strategy, were the defense and security implications of Chinese and Indian growth factored in? By that I mean concern has been expressed by many senators that, as you say, these are world powers and, over the course of a quarter-century, might become stronger still while our industrial situation was constrained. Has that been a part of your formulations?

EIZENSTAT: Absolutely. That's one of the reasons we've said that we will not take on binding limitations until and unless we get that meaningful participation. But I think it's important to understand that there are incentives for those countries to do so as well.

First of all, they increasingly recognize that they need their growth to be sustainable growth, that if they wreck their environment in the course of unfettered growth, that they're hurting their own future -- they're hurting their own population, they're hurting the health of their population, and they're hurting the foundation for their own future growth.

Second, there will be a strong incentive, as this trading system starts, for countries to adopt binding limitations, because only by doing that can they engage in trading. If they don't have such obligations, they can't trade. And that will be an incentive as well.

LUGAR: Senator Harkin?

HARKIN: Thank you, Mr. Chairman. Again, Mr. Eizenstat, you deal with a lot of these high-level government people at Kyoto. Are they aware -- are these people in these other governments -- are they aware of some of the benefits that might accrue to their farmers from what I just talked about, in terms of being big beneficiaries if there's these carbon trading units?

I just wonder if they're even aware of that, and are they expressing that to their agricultural communities?

EIZENSTAT: I think the answer is that they are not yet, and one of the things that we found at Kyoto and one of the breakthroughs that was made is that a whole range of concepts that the developed world wasn't aware of. Trading rights is a U.S. concept. They didn't know anything about trading rights. There was no European about it. They

't know anything about sinks, they didn't know anything about join-up limitation of credits.

We educated the world at Kyoto and leading up to Kyoto. We need to do the same thing, Senator Harkin, with respect to developing countries and make them realize the benefits that these credits can provide, and the detriment to agriculture if they don't act.

They will be the ones that will suffer most from the effects of climate change. All these models indicate that it is countries that are already having difficulty with droughts and the like who will be the most impacted, and therefore we think with education and with diplomatic efforts, we will be able to convince them to participate.

Are we there now? No, but we will be.

HARKIN: Does the ~~treaty exempt 123 nations from restrictions on industrial gas emissions?~~

EIZENSTAT: The treaty does not include developing countries assuming binding obligations. In that sense, they have not assumed the kind of obligations that the developed countries have assumed. And that is the reason why we're putting such an emphasis on getting key developing countries -- and there are perhaps 15 or 20 who really make a difference -- included in meaningful participation.

That's our biggest challenge. That is the biggest gap from Kyoto that has to be filled.

HARKIN: I find it interesting that some countries you mentioned earlier, like Mexico, South Korea -- they chose to identify themselves as a developed country for purposes of OECD, but for these purposes they say they're not developed countries. Now, which is it? I mean, how ...

EIZENSTAT: Well, this is the point that we're going to make, that if you want to be part of a developed country club -- in the sense of participating fully in it -- you ought to assume the obligations that other members are. And if you want to become a member -- as, for example, Argentina and a number of Latin countries do -- then, likewise, you should be one.

We were just at the OECD on a separate set of negotiations, the investment negotiations only a few weeks ago. We had Brazil, we had Chile, we had Argentina, we had Hong Kong all asking to enter the OECD. It seems to us if they want to enter that they ought to assume the kinds of obligations that the members of the OECD are doing.

HARKIN: Lastly, why did the developed countries allow Australia to set an emission target above 1990 levels when the rest have to go below it? Why was Australia exempted?

EIZENSTAT: That's a good question, and [one of the] most difficult issues we had to deal with. In the end, it was a question

...having no agreement or allowing the Australians to take that position. They took that position, because they are almost entirely dependent on coal, to a greater degree than any other developed country.

They are also relatively small emitters, in terms of percentage terms of greenhouse gases, and so allowing them to take what was still a reduction from expected rate of increase was, in our estimation, worth getting the other countries -- like the European Union, who made eight-percent reductions, Japan, which made six-percent reductions, who are the really big emitters -- to do so. Even Russia took a stabilization level, and the Ukraine and others, and we wanted to lock in those very significant reductions, and, importantly -- very importantly -- lock in the flexible market mechanisms that we ourselves championed.

If we had not been there, ~~you'd have had a treaty that~~ would have had even deeper reductions and mandatory measures to reach them, like regulations or energy taxes. The fact that we insisted that we not do that is what led to these flexible market mechanisms. That, in turn, is what is responsible for the relatively modest and small costs that Chairman Yellen described.

HARKIN: Thank you very much.

LUGAR: The chair will recognize Senator Craig, but let me say, at this point, I'm going to recognize Senator Craig. I will turn the floor over to him as soon. As he completes his questions, he will want to go vote, and I've advised all other members to vote now, and we will have a recess then that will last approximately 15 to 20 minutes.

(UNKNOWN): 'Bye, Larry.

EIZENSTAT: Mr. Chairman, might I inquire ...

LUGAR: I'm going to have the opportunity to preside over western democracy from 11 to 12.

CRAIG: I'll ask the questions.

LUGAR: All right, and I recognize you and let you ...

CRAIG: Well, I'm not asking that. I was asking how long that the hearing would go on.

LUGAR: Oh, I think in -- it looks to me as if we're headed to noon, 12:30, 1 o'clock.

EIZENSTAT: Mr. Chairman, my only problem is I'm expected to testify in the House on this same subject at noon. I'm sorry about

LUGAR: Yes, well, I'm certain you'll be completed long before

, but we will have some more questions after we return, and we'll excuse you, Mr. Secretary, of course, for our House colleagues.

ROBERTS: Bill, why don't you go ahead? I've got to go ahead and preside on two votes.

EIZENSTAT: Mr. Chairman, thank you.

ROBERTS: Does the chair envision having another hearing in the near future on this, in regards to ...

LUGAR: One is not scheduled, but we may very well want to do so.

ROBERTS: OK. Thank you, sir.

CRAIG: I'm going to find myself in a time crunch, so I'll ask just one question, but, ~~first of all, let me thank all of you~~ for being here today, and, as the committees of jurisdiction, search out this issue and better understand it in the Senate.

Secretary Eizenstat, you mentioned that, within the next while, the United States and other developed nations will sign protocol or protocols that you have agreed on. What will they be?

EIZENSTAT: What will the ...

CRAIG: What will you be signing?

EIZENSTAT: We would signing the Kyoto Protocol that was negotiated in December.

CRAIG: Will that portion of it then be brought to the Senate?

EIZENSTAT: No, sir. We will only bring to you a protocol if and when we achieve meaningful reduction from key -- meaningful participation from key developing countries. This is, in effect, what this Senate has admonished us to do -- to achieve that. We have not yet achieved it, and only when we do achieve it would we want to present that to you.

CRAIG: The protocol that you will sign is -- do you believe that to be an enforceable document and something that the United States should use, then, as a process or procedure to fall into compliance based on protocols signed?

EIZENSTAT: Only when the Senate has itself ratified it. In other words, signing the agreement is simply an executive action, indicating our earnestness in locking in what we have.

CRAIG: Agreement with ...

EIZENSTAT: It is not enforceable on us, nor would we be able to force it on others until they themselves go through their own ratifications procedures. Each country, of course, has its own

liamentary procedures.

CRAIG: OK. Let me thank you very much for that. I'll ask the committee to stand in recess until such time as the chairman reconvenes it. Thank you.

(RECESS)

LUGAR: ... discussion we had in this committee and perhaps elsewhere last year has come into view, namely that alternative sources of energy, in addition to petroleum, would be considered much more seriously, that they would become much more a part of our energy policy. And, of course, that substitution does make an enormous difference, as well as in terms of the carbon fixation or "sinking" situation that you were describing earlier. But I appreciate that clarification.

LUGAR: Let me, in behalf of Senator Roberts, who is unavoidably detained in the chair of the Senate, presiding during this hour -- he wanted assurance, and I'm sure the committee members do, of what the administration is likely to proceed in doing. Obviously, the treaty will not be forthcoming for a while, and assurance has been given that back-door approaches through regulation and so forth will not achieve what the treaty couldn't do. But what is the interim plan for the administration, say, during this year, in which apparent the treaty will not be submitted formally?

EIZENSTAT: Well, I'd like to add one part, and perhaps Chairman Yellen could then supplement that. I would that this year there will be perhaps three major activities. One is trying to develop the kinds of rules and procedures for emissions trading that will permit the trading to go on in an unfettered, genuinely market-based way without artificial limitations and barriers. And that will occur, Chairman, between now and Buenos Aires, and perhaps even after.

Second will be a full-court diplomatic press on developing countries, again not only by ourselves, but in conjunction with our allies. We are also working with Russia, Japan, Canada -- indeed, I have a meeting this very day with them -- New Zealand and Australia to develop the concept which we talk about as the umbrella, and that would allow trading amongst and between those countries.

And then, legislatively, there are a number of steps, and administratively. We hope, for example, that by actions we can make the federal government more of a model in terms of energy conservation. We also have the president's \$6.3-billion tax reduction and R&D package, which will come before the Congress, and this will help jumpstart us down the road to increasing technology incentives and incentives for taking sound practices which will help on emissions.

The technology is an area where we think there is enormous opportunity for reducing costs and for achieving these benefits in ways that benefit our economy and not hurt it. For one thing,

environmental technologies when I was undersecretary of commerce, that' -- we set up a whole unit on environmental exports. This is going to be a huge source of revenue for the U.S. as we transfer technology to countries that will need it to comply.

Second, people like the chairman, Jack Smith, of General Motors, announced only a few weeks ago a whole new enterprise for a new generation of dramatically improved fuel-efficiency cars. Texaco has a technology that can convert natural gas into clean-burning, highly-efficient diesel fuel to reduce the amount of natural gas that's flared.

So there are innumerable technologies that the president's initiative will help stimulate, and perhaps, Chairman Yellen, you might want to ...

YELLEN: Well, I think ~~you've hit all of the major things~~. I'd simply say that the president's plan focuses on taking first steps that you could think of as win-wins. They promote energy efficiency and these are things that I think it would be appropriate for us to do that are good for our economy, regardless of what happens with Kyoto. These would be good things even if there were no problem of global climate change. They enhance energy efficiency.

And one of the striking things is that most engineers, particularly, who've looked at the way we use energy in this economy, many opportunities for what is referred as "no regrets" policies, namely, these are policies or existing techniques that we could use to reduce our dependence on energy that would pay for themselves. So not only they not have positive costs, but there are range of things we could do that have negative costs, namely, they promote net economic benefits. And so the plan is to start with those things.

I would also add that the president supports electricity restructuring, and that's an initiative that, I think, can both bring great benefits consumers and really offset any of the costs that -- probably completely any of the costs that I've mentioned and also promote, at the end of the day, some reduction in greenhouse gas emissions.

LUGAR: Secretary Rominger?

ROMINGER: Yes. I would like to add what we plan to do at USDA. As I mentioned in my testimony, we are reorganizing our Global Change office and staffing that up so that we will be better able to coordinate what we're doing within USDA, all in different programs that I mentioned that have research activities on global change, and also be able to better coordinate and work with this committee and with the agricultural community and others that are interested in what agriculture's component of this will be.

And then, secondly, we will be increasing our research if the Congress grants our request for an additional \$10 million for research funds, but we'll certainly be ongoing with the research that we're

g to better identify and beef up the science on sequestration by forests and the kinds of activities that farmers could benefit from in sequestration in soils, where we could have a win-win with improving soil quality at the same time that we are reducing the greenhouse gas emissions. So we think there are some opportunities for farmers there that we want to begin exploring.

LUGAR: Let me just each of you, in your various capacities, without knowing how any of you might be influential, to ask the administration to take seriously our plea for an inter-agency energy and environmental security task force. I make this suggestion on the basis of activity we've had in another context with the Nunn-Lugar program and non-proliferation, and it has never quite happened. But it's a very important situation, because here we have national energy policy, environmental policy, agriculture, plus very big foreign policy considerations with all the rest of the world, and this is just very difficult to do.

I think you're doing it admirably, as you discuss here today as colleagues, and you cleared your testimony with each other, obviously. But it makes it very difficult for members of Congress or the public to get a handle on this, even as we might applaud disparate initiatives to come, and which you could point to, as a part of the overall plan. But, as many of us don't see the overall plan, it is difficult to evaluate this.

And I mention this, because even a number of good suggestions -- Miss Yellen, have made a point that with energy efficiency or with things that Secretary Rominger is doing in agriculture, we ought to be doing those whether we had Kyoto or not. They are a benefit, as efficient Americans -- cutting costs, having a better standard of living and all. When represented as a part of Kyoto, given the fact that there may be some negative connotations there, some things that otherwise were seen as perfectly legitimate take on an adverse case, and that would be unfortunate. So I ask you to consider carefully that.

I have just one more question of any of you, and that is ...

EIZENSTAT: I just want to say that we certainly will. It's a very interesting idea. In a way, we have been doing that, leading up to Kyoto, in order to develop our program. We had an inter-agency group, and it's been continuing to meet. But thank you very much for the suggestion.

LUGAR: This is such a big item, and you've presented it correctly that way -- if, in fact, climate changes of the magnitude you're suggesting are occurring, and the insurance policy that involves billions of dollars as well as transformation of many of our attitudes -- this is not just simply another piece of legislation or a treaty. It's a very large change in American life that is going to require a lot more coordination and probably has to start at the White House. And I mentioned the National Security Council and the Council of Economic Advisers, because these are basically the instruments that

have in our country for security and economic policy.

YELLEN: I think it's a very valuable suggestion, and we will certainly pursue it.

LUGAR: Let me ask, just finally, how could the Kyoto agreement be amended? Our country is signing on to something here, but, at the same time, as changes are suggested, how do you go about amending the treaty?

EIZENSTAT: The protocol cannot, strictly speaking, be amended before it enters into force, although it may be possible for the conference of parties to adopt a further instrument such as a supplementary protocol which could then be integrated into Kyoto, and this is something we're reviewing now.

After entry into force, ~~it can then be amended pursuant to~~ Article 20 of the protocol, and under Article 20, Mr. Chairman, the parties would try to adopt the amendment by consensus. If there were no consensus, they could do so by a three-quarters vote. So that is essentially the way in which it is amended.

LUGAR: I thank each one of you, especially for your patience, given our votes on the floor and other interruptions, but we appreciate the comprehensive testimony you've offered, the answers to questions. Obviously, this committee has an intense interest in the subject, as do some of our other colleagues, whom you visited. But we appreciate your spending this time with us this morning.

EIZENSTAT: Thank you, Senator.

YELLEN: Thank you, Senator.

LUGAR: The chair will now call another distinguished panel forward and that will include Mr. Dean Kleckner, president of the American Farm Bureau Federation; Mr. Fred Krupp, the executive director of the Environmental Defense Fund; Mr. Mary Novak, senior vice president of WEFA, Incorporation, Wharton Econometrics; and Marty Strange, senior fellow of the Center For Rural Affairs.

LUGAR: We thank you all for coming to our hearing to offer testimony this morning. The chair would like to recognize each of you in the order of introduction, that would be, first of all, Mr. Kleckner. Would you offer your testimony?

KLECKNER: Thank you, Mr. Chairman, very much. I am Dean Kleckner. I'm national president of the American Farm Bureau Federation. I'm a North Iowa corn, soybean and hog farmer. Incidentally, a neighboring county with farmer Senator Grassley, who was here earlier today. We're the largest organization of farmers and ranchers in the world as well as in the U.S.

And I'm a farmer, not a scientist, but I've reviewed the science behind the administration's climate change policy, and I do not find

particularly compelling. I believe that, based on current science, reasonable people can still disagree about whether the drastic action prescribed by the Kyoto agreement is justified.

And there is disagreement. The George C. Marshall Institute reports on what they call the "fading crisis" of global warming, and then they say, "Consider the trend of predictions from the United States Intergovernmental Panel on Climate Change," the IPCC. In 1990, this United Nations Intergovernmental Panel on Climate Change predicted 3.3 degrees Centigrade global warming by 2100 -- in '90, 3.3 degrees. Two years later, in '92, they predicted 2.8 degrees change of global warming -- in increase from 3.3 down to 2.8, from '90 to '92. Three years later, in '95, they predicted one and a half degree Centigrade of global warming by 2100 -- coming down from 3.3 '90, 2.8 in '92, one and a half degrees change in '95.

So there is no scientific agreement on this, despite what we've heard from witnesses who said that the ball is over, we all agree, in essence saying those of you who don't agree are weird people. The disagreement, in my view, is increasing, not decreasing.

Farmers are interested in climate change, we are willing to consider the facts, based upon good science and willing to our part in reducing emissions. But many farmers who have followed this important issue believe that the administration is acting hastily and prematurely in leading international efforts for immediate, legally binding and enforceable caps on greenhouse gas emissions.

We like to think of ourselves as the good guys. We're farmers, we're good guys, but we're being portrayed as villains when it comes to greenhouse gases. Our own EPA blames agriculture for 43 percent of total methane emissions, 46 of the nitrous oxide generated from human activity in the U.S. Led by our own administration again, international negotiators are pressing for strict, binding limits on these emissions. For agriculture, we could see -- I think we would see -- new taxes on fuel and fertilizer, forced mileage requirements for light trucks and other motor vehicles, controls on planting, cultivation and harvesting practices, and limits on the number of livestock per acre.

If we're going to do what we agreed to do, we cannot do it voluntarily. They'll have to force us to do these things.

Fuel and energy cost increases resulting from the Kyoto agreement could deal us an especially heavy blow. Fuels and energy-related inputs, like fertilizer and pesticides, account for about a fourth of our operational expenses. The U.S. Commerce Department -- our own government -- said this could require the equivalent of a 25-cent gas tax increase. Fuel cost increases, even at these levels, would impose a big hardship on U.S. farmers, and that's probably understating it.

A study by our American Farm Bureau projects losses in net farm income from 13 to 85 percent, depending on the specific commodity and fuel price assumptions. At the time we were doing our study -- and

Mr. Frense (ph) one of our senior economists who led the study is here with me, and if there are any specific questions, Mr. Chairman, on this issue, I would defer to him. But at the same time we were doing our study, unknown to us or unknown to them, Sparks Commodities (ph), Inc. were doing a similar study and came out with remarkable, similar conclusions, as we did, again basing it on the Commerce Department, our own department's figures.

Little recognition is given to advances in agricultural practices, conservation and energy efficiency by farmers, particularly here in the U.S., and we've heard that earlier today from previous witnesses. Our improvement in efficiency in the use of fuel, fertilizer and farm chemicals is significant. We have dramatically increased our use of conservation practices. For example, 30 million acres now in the CRP, and that's a very ambitious environmental exercise which dramatically reduces greenhouse gases. Unfortunately, the Kyoto agreement gives no credit to U.S. farmers for these great advancements.

The administration proposal would disadvantage U.S. ag producers in world trade because it sets no binding limits for the developing countries, and we've heard that again today -- what, 30 countries would be forced to participate, the rest would not, and some of those are major competitors for world markets.

By the administration's own projections, carbon dioxide emission increases from developing countries will soon outpace those of the United States and other developed nations. By forcing compliance of developed countries only, we fail to invest our efforts where they will achieve the greatest emission reductions. In the process, we place our farmers at that competitive disadvantage and make them easy prey in this new world of free trade and market-oriented farm programs.

The Farm Bureau makes the following five recommendations regarding the Kyoto Protocol and future international climate negotiations.

Number one: there must be a full and informed public debate that involves agriculture and agriculture policy makers.

Second point: the administration should not sign the Kyoto Protocol because of its potential harm to U.S. farmers, and because it violates the key principals of the Byrd-Hagel resolution.

Three: if the Kyoto Protocol is signed by the administration, it should then be submitted immediately to the U.S. Senate for ratification.

Four: we strongly urge Congress to be vigilant in opposing efforts by the administration to implement the treaty through rules, regulations or other means. I know they're saying it won't happen, Mr. Chairman, you just got to be vigilant, you and everyone else.

Number five, and conclusion: the administration should withdraw support for legally binding and enforceable caps on greenhouse gases and renew its commitment for voluntary emission reductions as prescribed in the 1992 Rio Summit.

Thank you, Mr. Chairman, for this opportunity.

LUGAR: Thank you very much, Mr. Kleckner, for your testimony. The chair would like to call now upon Mr. Fred Krupp, executive director of the Environmental Defense Fund. Mr. Krupp.

KRUPP: Thank you, Mr. Chairman.

First of all, Mr. Chairman, I want to associate myself with the fine comments this morning of Senator Roberts in complimenting you for your leadership on the Farm Bill. As he said, it was and is the most environmental Farm Bill this nation has ever known...

LUGAR: Thank you.

KRUPP: ... and, on behalf of our 300,000 members, thank you. I would also ask that my written statement become part of the record.

LUGAR: It will be placed in full in the record.

KRUPP: Thank you for extending the invitation to the Environmental Defense Fund to testify this morning. We do have over 300,000 members around the country and have personnel in offices located in 10 states. Our involvement with climate policy goes back over 15 years. We have an interdisciplinary team of scientists, economists and lawyers who are working to understand not only the problems but to suggest solutions associated with this problem.

And that's where I want to focus my testimony today, on solutions. My written statement does talk about our views on the effect on agriculture, which, I might just say this morning, we view as a negative one. We think global warming will have significant negative effects and there will be very noticeable regional changes, with state-specific impacts resulting from the warming of the atmosphere, which adds urgency to begin coming up with constructive ways to deal with the problem.

But, as I mentioned, EDF's interdisciplinary team has been constructing practical solutions, because we think that it is possible that early actions can both diminish or even avoid damaging impacts but also be good for U.S. agriculture and the economy at large. In that regard, we see the Kyoto Protocol as a remarkable international political commitment and as an essential first step for dealing with this most significant of global environmental problems. We hope the United States and the world community will continue efforts to build on this first step.

As part of the effort to achieve this agreement, EDF developed a proposal which incorporated emissions trading into the design of an

International system to limit greenhouse gas emissions. It is the Environmental Defense Fund's view that, through the use of market mechanism -- emissions trading -- as generally incorporated into the current protocol text, the greenhouse gas emissions reduction objectives of the protocol can be met in an affordable fashion.

This is principally because a market approach can tap the creative energies of many differently situated buyers and sellers, enticing them to engage in an unending search for ever-better ways to reduce emissions at lower and lower costs. In short, a greenhouse gas emissions trading market will do what markets do best. It will continually drive costs down.

Another way to put it is -- Senator Roberts called this morning a partnership between industry and agriculture to address this problem, and I think the emissions trading system, in my view, stimulates and informs that partnership.

The U.S. has some good experience with market-based emissions programs, as Secretary Eizenstat noted earlier. In the 1980's, the Environmental Defense Fund developed a market-based approach to reduce industrial emissions of sulfur dioxide, one of the main causes of acid rain and president Bush adopted that proposal to cut sulfur dioxide emissions in half and to cap them at that level. As a result, the Clean Air Act of 1990 allowed companies to trade and sell any extra sulfur reductions they made.

Once that law was passed, the creative juices began to bubble up from the shop floor. One former CEO of a large utility told me that, within weeks of enactment, dozens of creative ideas began to stream into his office from his staff engineers, who previously had no reason to develop them. So, today, eight years later, companies are 35 percent ahead of schedule in reducing sulfur emissions at one-tenth the cost some predicted a decade ago.

The chart on the right, Mr. Chairman -- the top line show the business-as-usual trajectory that was predicted without the Clean Air Act being passed. The middle line is the legally binding cap under Title IV. And the line that bends most steeply down is the actual emissions, where we in this country are now four million tons ahead of schedule because companies are banking credits. For the first time in any environmental policy, a company gets credit for doing more than the law requires, and they've taken advantage of that.

In our judgment, with some key refinements, the major elements of this acid rain plan can also work to harness the power of innovation in the marketplace to reduce global emissions of greenhouse gases. First of all, let me talk about how this approach would work.

The chart on the left shows the business-as-usual trajectory, which is estimated to be 30 or 40 percent -- our emissions are estimated to be as much as 30 or 40 percent about 1990 levels by the beginning of the first compliance period in 2008. It's the abruptness by which we would have to come down to that first compliance period

that would cause economic harm and disruption -- could cause unless we get going early. That abruptness also limits the choices society can make.

The fact that emissions would continue to rise in the meantime also poses not only this economic challenge, but an environmental risk because the more we put these emissions into the air, the more we're putting into the air gases that will be there, in the case of methane, for a decade, in the case of CO₂ and some other gases, for centuries or more.

Fortunately, the market-based trading approach offers part of the solution to this dilemma, because, in such a market, as with sulfur, those countries and companies that could make more greenhouse gas reductions than required would earn credits by making those extra reductions.

But my central point today is that an identical economic incentive system can be put in place in the near future on a voluntary basis to begin making greenhouse gas reductions prior to 2008. The way this would work, under an early reductions approach, is that companies that make such voluntary reductions would be able to earn greenhouse gas emission reduction credits that they could save for the purposes of meeting any mandatory reduction requirements post-2008. They could also sell to other companies in the future.

In that way, reductions that are harvest from agriculture or other sectors in the next 10 years would be available to increase flexibility for those sectors in the future or to provide a revenue stream. Environmentally, this would also be a tremendous benefit, because we would be avoiding putting those gases into the air where they would continue to do their damage.

I think this program could offer farmers the opportunity and the benefits of earning credits only if they voluntarily wish to participate. Under the protocol, basically, those who reduce emissions early would be putting credits into a savings account. Such a credit for early reductions program that allows people who take voluntary actions today to benefit would create a financial, valuable resource for those who do what the world needs them to do. In fact, they could profit from improvements made in their management practices or energy efficiency.

There's many examples I might point to, and several in my written testimony. Let me just mention two in closing.

Agriculture contributes, by some estimates, 31 percent of all methane emissions, the second most prevalent category of greenhouse gases. Methane is 21 times more effective at trapping heat than carbon dioxide. About one-third of agricultural methane results from manure management practices, the majority of which are concentrated in larger livestock operations.

Because methane is a source of energy as well as greenhouse gas,

...ver, recovery of methane from livestock manure and its subsequent use of energy can offset some of the recovery costs and reduce greenhouse gas emissions. Now, if we put into place an early reductions mechanism, we would be providing farmers an additional value in the form of a marketable credit for greenhouse gas reductions that would add directly to the benefits of taking those actions now.

Similarly, in the Northwest, where there's already installed electric-generating capacity, say, on the Columbia River, if we give farmers the opportunity to enhance their agricultural incomes by transferring water rights voluntarily -- if they take water efficiency measures -- they can put water into a river, turn those turbines, generate electricity, displace the need for fossil fuel, earn revenue not only from the sale of the water, but from the accrual of these credits for doing something that reduces greenhouse gas emissions, all easing the economic transition later as well as the environmental burden.

In summary, I think there's challenges, but I also think there's opportunities for agriculture, Mr. Chairman, and I would look forward to working with you on such a solution in the coming months and years.

LUGAR: Thank you very much for your testimony. Miss Novak, would you give us your testimony?

NOVAK: Thank you for inviting me to give Wharton Econometrics' of where this argument is going, and I'd like to concentrate on a few pieces of my testimony, and ask that my written testimony be included in the record.

LUGAR: It'll be included in full.

NOVAK: Rather than go through my written statement, I just want to concentrate on a few big issues.

The scientific basis for this is under extreme discussion, and I agree that there is growing evidence that it may be a problem we might not face. In light of that, I agree completely with what Dr. Janet Yellen says, that we are only prepared to go forward if this is going to cause catastrophic problems, because if it's not going to cause catastrophic problems in global climate change in the short run, we are facing an enormous economic risk.

WEFA's analysis shows that if we go forward with the Kyoto agreement, we could put at risk 3.2 percent of our GDP by the year 2010 and 2-1/2 million jobs. We come to that conclusion through a detailed analysis of the energy, industry and macroeconomic sectors. We come to that conclusion, recognizing some of the pitfalls of the current Kyoto Protocol.

The protocol calls for the U.S. to agree to a legally binding it on emissions seven percent below our 1990 level. The only sets available in the Kyoto protocol come from perhaps some ability to store carbon through sinks and/or a very unspecified emissions

ing program with a small number of countries. There is nothing in the protocol today that calls for, requires or gives any opportunity, actually, for developing countries to sign on with us.

Further, within the protocol, there are very restrictive conditions placed upon people who would want to trade with us. They would have to agree to an as-yet-unspecified but necessary firm set of compliance measures.

In our analysis, we presume that Russia and some of the countries of the Warsaw Pact would be better off not trading with us, so that as we go forward, we have to assess what is the risk to our economic prosperity of taking on the burden of meeting this legally binding limit ourselves, or in combination with the truly industrialized countries of the original OECD. That cost is enormous.

The 3.2 percent of GDP ~~is more than \$300 billion.~~ It would cost each family in the United States \$2,700 in income. For families that earn twenty, thirty, forty thousand dollars a year, that's an enormous burden.

The agricultural economy would also be put at enormous risk. We have yet unspecified how we would account for the carbon in fertilizers. While we often assume that raw materials would be excluded, there is no guarantee, and, in fact, there is a lot of pressure to include that. That extraordinary cost, along with increasing costs from the direct consumption of energy, would severely ~~it~~ -- perhaps even reduce to nothing -- the profitability of our agricultural economy.

We show only a two- to three-percent loss in total output, but what we have not completely analyzed is the loss of profitability.

Further, our analysis shows, though, that the U.S. consumers would have to bear most of the burden, and, in fact, we're forecasting a 10-percent increase in the cost of food associated with this program. Every man, woman and child, every low-income family would end up spending 10 percent more each and every week to buy groceries. That is an enormous risk, and we've placed that risk -- that potential risk -- against perhaps creating a supplement to the Kyoto Protocol, that perhaps countries such as China and India might join in with us at some point?

One has to balance our economic risk, our loss of economic prosperity against this very long-run issue.

There will be no change in global climate between now and 2010. All scientists say we would not even experience a half a degree of global climate change until after 2050. We have a long time.

WEFA believes technology is the answer to most of our questions. What we want to make perfectly clear is timing is the key. Thank you.

LUGAR: Thank you very much, Miss Novak. Mr. Strange, would you

us your testimony?

STRANGE: Thank you, Mr. Chairman for the opportunity to present our views. My name is Marty Strange. I'm a senior fellow at the Center For Rural Affairs, which is a nonprofit organization based in Nebraska. I have a written statement with an appended report. With your permission, I would like to ask it be included in the record.

LUGAR: It will be published in full in our findings.

STRANGE: There are a lot of farmers who would think that a 10-percent increase in food prices would be the solution and not the problem. The truth is that American agriculture has suffered a lot from long-term economic difficulties, and I think that our recent turn toward market economies has produced some hope that, in the long run, we will be able to turn that around.

I think, at the same time, that there is mounting concern about the reality that scientific evidence -- and I'm definitely in the camp of people who believe that that scientific evidence weighs heavily now in favor of the conclusion that human activity is contributing to a serious problem -- the likelihood of a false negative conclusion is a lot greater than the likelihood of a false positive -- and that the risks are substantial if we don't take steps to correct the problem.

I think farmers have a lot at stake here. They can be victims of the problem or they can be victims of the solution, but they don't want to be victims of either. They can be winners in the solution if the solution is carefully crafted to respond to the conditions that are present in agriculture and in our society.

I think the greatest threat to agriculture, incidentally, is not the increase in temperature that, on average, is projected, it's the increase in variability and unpredictability and the wide -- the increase in the occurrence of extreme events. American agriculture, especially, operates in a very high-technology basis and does so within very narrow tolerances that are generally set by a benign climate -- a very happy environment to produce food in.

And so, we stretch out the growth season, genetically speaking, for corn and other major crops just as far as we can, because, within some pretty good tolerances, we know when that first frost-free date is likely to be, and when that first frost is likely to occur, and we can do marvelous things with that level of predictability.

But, with extreme events more frequent, that range of predictability will become smaller, and our ability to calculate the risks of unpleasant events in any growing season will become greater. I think that is the central threat, and it's one which technology now offers us very little range of hope to deal with in a constructive way.

I think it's as well important to note that agriculture contributes to this problem in particular ways, and that not all

ers are in the same boat with respect to this issue. For example, nitrous oxide emissions due to fertilizer use -- the United States consumes perhaps only one-eighth of the world's nitrogen fertilizer, but probably contributes about a third to a half of the nitrous oxide emissions from fertilizer, and that's because we prefer hydrous ammonia, a particular kind of fertilizer that is a particularly heavy emitter of nitrous oxide.

Now, farmers who rotate crops and maintain soil fertility by alternative means and who do a better job of managing manure, in the case of diversified farms, simply don't have as much demand or dependence upon commercial fertilizers and, relatively speaking, contribute less to this problem.

At the same time, we've heard discussion of the methane problem from manure operations. It's really quite startling, the growth of water-based waste management systems in large-scale hog -- especially hog facilities. These systems use anaerobic bacteria to decompose the manure, and that bacteria emits about 90 percent of the potential methane from that manure. Dry lot manure decomposes, using aerobic bacteria, and only emits about 10 percent of the potential methane, so the difference is dramatic.

In 1992, we estimated that about 28 percent of the U.S. hog herd was in facilities that used these anaerobic lagoons. These systems produced about three-fourths of the methane emissions for all U.S. hogs, and about one-third of the manure methane emissions from beef, hogs, and swine operations combined.

Now, this is a tremendous change in technology which has occurred in recent years. It's not that we don't know how to produce pork and produce it economically by any other means, but there is a cost advantage for some operators -- and the large-scale operators are the ones -- for using water-based waste management systems. Once you put that manure in water, you're going to have an environmental problem of one kind or another, and methane emissions into the atmosphere is a particularly severe one.

So not all farmers are in the same position and different approaches to this problem will affect different farmers in different ways.

I think we can -- the beauty of this issue for agriculture is that, instead of focusing, as the treaty does and all the controversy about climate change does, on where carbon is and shouldn't be, we in agriculture can focus on where carbon isn't and should be, which is in the soil. We've lost about half of the carbon that's in the original bequest nature made to our nation of soil carbon, and we need to work very hard at inventing ways to get carbon back in soil.

I would disagree respectfully with my friend, Mr. Krupp, on this issue of where the methane -- where the manure in those lagoons ought to go, because I think that carbon ought to end up back in the soil, rather than in the atmosphere as CO2 emissions from electricity co-

eration from lagoons.

We've talked about a number of strategies for dealing with these issues. None of them are glamorous and none of them are mysterious. Plant warm-season native grasses on previously-cultivated soils. The CRP alone right now is probably reducing carbon dioxide emissions annually by about 40 million tons. If we added 20 million acres to that program, we could offset another 22 million tons of carbon dioxide emissions per year.

We know that by reducing soil erosion to the level that's naturally offset by soil formation on highly erodable soils, we could do a tremendous amount of benefit, perhaps seven million tons of carbon dioxide equivalent per year.

Reduce fertilizer use, where we know very well that we have uneconomic waste going on, ~~and which produces both carbon dioxide and nitrous oxide emissions.~~ We could do a tremendous amount by reducing fertilizer waste in agriculture.

And then, finally, reduce the methane emissions from those anaerobic lagoons. This is a serious problem that is, fortunately, one that we have technology for doing. While it may not be attractive at this point, cost effective to the people who own these facilities, but it would be environmentally responsible and would have tremendous immediate impact.

We conservatively estimate that if we reduce the methane emissions from those facilities to a level that that same manure would produce if it were in dry lot conditions, we could reduce carbon dioxide emissions by about 81 million tons per year -- a major contribution to the solution of this problem.

Fortunately, most of the policy tools for dealing with these kinds of issues are well within the experience both of farmers and the Congress. We're talking about direct payments, for example, to plant grass, an old and trusted tool. And I can't emphasize enough the importance of grass.

We've heard a lot about trees, and they are valuable, but grass puts a much larger percentage of its carbon into soil, where it is more permanently sequestered from the atmosphere, and, in the long run, soil -- or grass can be grown in a wider range of ecological conditions and it can be put to many economic uses once it has been established. I think that we know from experience that farmers will respond to grass-planting options and that it's a good way for us to deal with the issue of carbon sequestration.

If we deal with excess emission credits, as there's been a lot of talk about internally within our society, it's entirely possible that generating plants and other facilities that are large emitters will to buy credits from farmers and spread these costs throughout society through the consumer.

Mr. Chairman, I'm going to conclude there. I thank you very much for your patience and appreciate the opportunity to testify.

LUGAR: Well, thank you very much, Mr. Strange. Let me ask -- pick up on a point you just made, Mr. Strange, and that is, this panel has developed -- Mr. Krupp raised in his testimony -- this idea that these credits could be arranged internally, that is, within the United States. Much of the discussion that we had with the other panel came with the thought of buying credits from Russia, Ukraine, Eastern Europe, other countries, and that may still be where we're headed, and clearly, that wasn't worked out at Kyoto, which is one of the deficiencies that critics of the treaty point to.

Less well understood, I suppose, is this internal arrangement. For example, if you were to internalize this, to what degree would you do so? On my farm, for example, if I were to plant either grass, as you've suggested, or trees this year on 35 acres, could I develop, under your idea, some credits?

And we don't know, of course, whether the mandates will ever occur, because we don't know whether the treaty will finally be signed, quite apart from being ratified by our country or the other countries. So a lot of this is very prospective.

We're taking a look both at the climate change situation -- that's prospective -- but also at legislation, which people have to estimate.

Now, let's say, as a prudent farmer, this year I said, "I think I see something coming along the trail here" -- whatever year it may be after 2000, so I want to pile up some credits on my farm now. Now, we've probably should have asked the administration witnesses, but to what extent -- could there be some national mechanism, some accounting systems that -- either for farmers or industries or whatever, unit? Maybe USDA, as a governmental entity, or whoever is involved, we begin to do this sort of thing. Have any of you done any theoretical brainstorming in this area?

KRUPP: The Environmental Defense Fund has proposed such a system, Senator Lugar, Mr. Chairman, and we believe that this is an ideal sort of arrangement for a lot of reasons. Even before the Senate takes up the question of whether the Kyoto treaty should be ratified -- and we've heard that won't be any time soon -- why should those farmers who want to be part of the solution and reduce emissions, say, from their feedlots, be subject to the risk that then there'd be a second bite of the apple in 2008 and they'd be asked to do more?

There should be a system set up now that protects them against the risk that taking early action will incur -- as many CEO's of many businesses have told me over the years that I've been running the Environmental Defense Fund, that, "When we do things voluntarily, then we're asked to do -- you know, reduce another 50 percent later." So this sort of system that we have proposed could protect

s against that.

LUGAR: Have you published this material, or -- when you mention a system that you've developed, is this is the form of an article or a journal at this point?

KRUPP: Yes. It's in different materials that -- none of them -- I don't think we've published an article in a journal, but we'd be happy to provide those materials to you.

I might mention your comments about that the market is speculative today, 'cause we don't know if Kyoto will be ratified is quite true. Nevertheless, later this morning or this afternoon, the Niagara Mohawk Company of New York is committing to sell carbon reductions to the Sun Corporation -- SUNOCO -- from the fact that they will be installing biomass and solar energy facilities.

So an incipient market is beginning to emerge, and it would be possible for Congress to take action that would provide these incentives and these protections for farmers who do things early.

LUGAR: Well, I make that point largely because we've had testimony earlier, some from senators as well as from witnesses, that -- and you, Mr. Krupp, have paid tribute to the Farm Bill exercise we've had. You know, many of us feel that substantial benefits occur to the environment in the Farm Bill and legislation that occurred and farmers who are taking advantage of its provisions.

But, as much as you say, if a second bite of the apple comes down the trail without recognition of this, people in agriculture in our country feel like -- properly put upon by all this.

KLECKNER: Mr. Chairman, these things may be good, probably are good, but I think we need to point out that, under Kyoto, no credit is given other than for tree-planting and biomass planted after 1990. Maybe these things should be done, but, again, the international community will give the United -- as we move toward implementation of Kyoto, maybe -- and ratification, which we hope won't happen, from our point of view, but there will be no international credit allowed for these things. And so, will we really want to do them? I just want to raise that question. Maybe so, but there's no credit given.

KRUPP: I might say -- and probably, we can't get into enough detail here this morning, that under the proposal we've put forward, the United States, as a sovereign, could give credit for sequestration in the soil, and we could decide -- Congress could decide -- to do that, give credits to those actors.

LUGAR: But internally, as opposed -- Mr. Kleckner's saying you couldn't do it externally.

KRUPP: We could do it internally, but by doing it internally, we would provide real, marketable credit and protection for those farmers.

LUGAR: Yes, Miss Novak?

NOVAK: I want to clarify a few things here. A marketable permit only has value if a market is established, right? And, in terms of this global problem, the U.S. would only be able to create a market price for these credits if we agreed to go it alone and establish for ourselves a commitment. In that case, we would establish a price for these permits. We really have to fundamentally keep in mind that it is the issue of the global problem that creates the global value of the permit.

Now, we're sort of jumping the gun here, talking about counting credits against something that we haven't decided is really necessary to do. And the value of those permits will be highly dependent upon what we, as a sovereign nation, decide to do relative to the rest of the global community.

And I want to point out that, in our analysis, we say that to give a price signal that would meet the commitment that we are talking about making under the Kyoto Protocol would require \$265 per metric ton. Now that is an extraordinary charge.

And I want to note that Dr. Yellen, even though she came up with only \$14 to \$23, she only got to those numbers through all this global trading that isn't in the protocol, and then if you back that out, her numbers say it's \$250 a ton. And I worked up the numbers.

So we're talking about perhaps creating -- perhaps creating -- some sort of unspecified credits for sinks and biomass that -- one thinks that's a little bit of extra money -- and putting that against the risk of going against trying to come up with a solution, a short-term solution to a long-run problem that would cause the United States to end up trying to reduce their energy use 50 percent in 10 years.

Now that package of concepts can't be viewed at and chipped away at in these little tiny ideas. One has to look at the commitment the country would be making and whether that makes any sense.

And I want to clarify -- we have talked a variety of times here today -- Dr. Yellen brought it up, Mr. Eizenstat -- that there are a series of what they're calling "no regrets" options, in terms of technological and emission trading solutions. Those are not no-regrets options. If they were no regrets, we would be adopting them today.

Our economy works the most efficiently of any economy in the United States at putting together capital, labor and energy, and we have persistently chosen to continue to use energy in that dynamic. And so, viewing a capital option and saying it's no regrets doesn't count if the economy isn't, through its dynamics, choosing that capital.

LUGAR: Well, I think your logic is very important, and the rigor you know I appreciate. I supposed I opened a Pandora's box by

ulating that, in fact, at the end of the trail, the treaty might be ratified, so I was saying, as a prudent farmer -- getting back to my microeconomic situation -- if I think sometime, maybe not in my lifetime, but in my grandchildren's, they're going to face this problem, should I be storing away these credits. It just gets to the point, I think, some of us in agriculture feel we never get credit for what we do, and it's a second bite of the apple down the trail.

But you're absolutely correct. Unless there is some protocol to begin with or some construct, why, all these credits won't make any difference one way or another. And, clearly, the market does work and, as you pointed out, our nation has chosen to use energy, and we've chosen to use milly (ph) and oil and chosen a lot of things that are there.

But our hearing today is based upon the fact that our country, rightly or wrongly, went to Kyoto. We heard Secretary Eizenstat, who was one of our negotiators, indicate that our government's entering into serious obligations. Congress is asking how far have we gone, how far should we go, what sort of stipulations are there all along the trail. But this is very serious business for reasons that some of you would say it ought to be, namely, that there is some threat of global warming and others of you would not so much of a threat.

Mr. Strange, do you have a comment you wanted to get in at this point?

STRANGE: Well, just to say that it seems to me that the panelists here -- there's some fair amount of agreement, that you can't expect farmers to do anything unless there's a mechanism that makes it reasonable for them to do so, whether it's a direct payment from the government or an emissions credit system of some kind.

But my point is that, within the ranges that we're talking about, they have a lot to offer this society and the world, because they are in a position to get all of that carbon that's up there, floating around -- you know, the excess carbon that's being put there by everybody -- get it out of there, where it's doing some bad, and put it into the soil where it improves the productivity of -- long-term productivity of American agriculture.

Our loss of carbon is a serious threat to the future productivity of our soil and of our agricultural economy. We need to get that carbon out of the atmosphere, no matter who put it there, and get it into our soil. And within the ranges that we're talking about, if it's \$250 a ton, for example, and switchgrass planted in western Indiana probably will sequester about a third of a ton a year, that's, what, 85 or so dollars. Now, if you had the economic use of the grass to graze or hay or to sell to a biofuels plant to turn into electricity, wouldn't you rent -- in western Indiana, wouldn't you get that credit for \$85.

LUGAR: That would be amazing return. No, I suppose Miss Novak

and argue, as I would, that 250 is based upon one set of assumptions, as were Chairman Yellen's \$14 to \$17 or whatever, in response to one of my other questions on a whole set of others. I was trying to pin down, as you may have observed, how much this is going to cost, whether a transfer of wealth might go from the United States elsewhere. And some of you have developed maybe nowhere, because maybe no one will sell.

In other words, the suggestion has been, for instance, that Russia or Eastern European countries, for various reasons, might not want to sign on to the protocols that are required to be a willing seller of all of this, so that even if we wanted to buy, we are not sure out there in the world we can do this. And since a lot of the solution depends upon these transfers, that becomes a critical element.

STRANGE: And my point is simply that if we're going to -- if anybody's going to start paying anybody to sequester carbon, there is nobody who's going to have a more comparative advantage in that market than American farmers. Climatically, soils type and in every respect, we're better positioned to take advantage of that opportunity, no matter what the mechanism or the source of the money is.

NOVAK: Again, I just want to clarify. If it was economic, American farmers would be doing it today. So the value of returning carbon to the soil is dependent upon a climate change problem?

One has to continuously put in context that we have an economic decision we're making today under today's pricing mechanisms, that technological opportunity changes if we change the value of our resources through a climate change initiative.

But we haven't yet signed on to that, and when I look at these and hear about these programs, I say that these obviously are programs that are only apparently economic under the extreme condition of saying we're going to reduce our energy use 50 percent.

So there is an oddity here about discussing potential opportunities for the agricultural community that would come at the enormous cost in terms of economic performance and the cost to each family. And I can't say it often enough -- they can't be looked at independently.

LUGAR: Well, I accept. On the other hand, just to be the devil's advocate, we passed, as a part of the Farm Bill -- which moved, arguably, strongly toward market economic choices, I think properly so -- a conservation reserve program and enhancement that was very, very substantial.

Now, one reason we did this was because there was recognition from a societal point of view, as opposed to an individual farmer's point of view, that our riparian waterways or various other situations were trying to protect out there -- wildlife, for example, soil erosion -- needed some treatment.

Now, you know, it's an age-old problem of whether the individual farmer will be conscious of the carbon in his soil or soil erosion or so forth. Most of us, as farmers, say it's our business to do that, 'cause this is a wasting asset otherwise, and we want to enhance that, but not all farmers see it that way, and, in fact, some things get lost between the cracks.

So, as a society, we said we want to stop soil erosion and various other things, and so we offer incentives to do that. I can conceive you might do with carbon in the soil, leaving aside whether we're discussing global warming. And I've not heard, prior to this hearing, such a concentrated emphasis on the possibilities of restoring carbon in the soil and why that is important. I'll probably want to circle that and see what's there.

All of this, unfortunately, is very hypothetical. This is the reason the hearing is being held, ~~because we are not in limbo~~, but this nation is in consideration of some very large changes -- in foreign policy, environment, agriculture and all the rest -- and my only reason for even raising this line of questions speculatively is what do you do in the middle of one of these situations?

For example, arguments that I've heard from witnesses and senators, this may go on for years. Now, maybe so, and maybe it outlasts one whole generation and the next one then takes it up. But, at some point, some group might come into the Congress or the Administration or so forth and say, "This is it. We have the majority, we're signing up," and so forth.

So it is prudent, really, as all of you are, to be sort of thinking creatively about this. Yes?

KLECKNER: Mr. Chairman, your point is well taken, but I think it's almost regrettable that you're holding this hearing and that you find it necessary to hold it, 'cause I don't think the science is there for us to do what we're proposing to do on the Kyoto treaty. It's regrettable that we signed on, but we did, so the hearing is necessary.

Secretary Eizenstat said that global temperatures have increased one degree Centigrade in the last hundred years. We agree with that, the figures are there. You can prove anything with figures.

What he didn't say was that that one percent in the last hundred years from 1900 to 2000, the increase peaked in 1960 and has been declining since then. From 1750 to the present, temperatures have risen about a half a degree Centigrade over the course of those minicycles that we -- the minicycles, not many -- many minicycles, perhaps, in 250 years -- a half a degree. One degree since 1900 to 1960 and then somewhat declining since 1960.

I just point out -- and 1750 to 2000, or 250 years, is a relatively short cycle in itself in the context of the ice cap and in the Antarctic and 700- to 1,000-year tree rings that we know that

e's long-term cycles.

So we're jumping the gun. Science is not agreeing, and scientific consensus is less now than it was three or four years ago. Scientific disagreement is increasing, not decreasing, so why jump the gun and do what we probably, 10 or 15 years from now, will prove that we didn't need to do?

president Carter, I understand, appointed a commission when he was president, and that's not long ago. We both it, Senator ...

LUGAR: Yes.

KLECKNER: ... on the imminent global danger of global cooling. Now, it's global warming. I would predict that the young people in this room today, if you live a normal life, will go through this cycle of -- they lived through global cooling under Carter, global warming today, be back to global cooling and back to global warming in their lifetime. And science doesn't know why.

LUGAR: Well, and perhaps. Let me just speak for the last pound for a second and say, you know, essentially, they were saying that science has a consensus that two and a half to six degrees in global warming will occur in the next century. Now, that's a very different order than one or a half a degree in the last 250 years.

So a number of people in public policy was say, "You know, is right?" And this panel comes along and says, "Probably not, it isn't happening that way. In fact, it's hardly perceptible at all." And then this leads policymakers into a what-if situation.

The panel talked about an "insurance policy," in essence, what if, in fact, the worst scenario is right -- two and a half to six -- and the flooding of Florida and the Everglades all of the rest of it, as opposed to the more sanguine view of a half a percent for the next quarter of a millennium.

So this is, in part, what impels this, among, maybe, people who don't know very much about science or who are confused, to say the least about it. I don't know otherwise why we are in the argument, but I gather that it's because of this, that there's a great fear on the part of many that, in fact, there's something very different going on here that could be cataclysmic and that we would suffer the century of our grandchildren, as it was pointed, if we were not more perceptive.

KRUPP: Mr. Chairman, if I might just be allowed a word or two. I, you know, have great respect for Dean Kleckner. We served together in the Trade Policy Negotiation Committee, and I fervently hope, for my children, that he's right, that the science will turn out differently. But over 2,000 scientists appointed by 160 nations and the globe, in perhaps the largest peer-reviewed study ever conducted by mankind, concluded that the probability suggests, the evidence suggests that humans are already having a discernible impact

the planet. So -- and they predict the case is even stronger if we continue to pump these gases into the atmosphere.

You know, in terms of the costs, I might just say I remember eight years ago as -- in my current position, I watched hearings on acid rain, and there was very credible evidence that the costs could be \$1,600 to reduce a ton of sulfur out of the skies. Thanks to the American entrepreneurial spirit, the wisdom of the Bush administration in adopting a market-based policy that captures innovation, that uses the market system to innovate for the things society needs, the last trade came off at \$60 a ton, not \$1,600.

So I think the challenge is -- and trading is built into the Kyoto Protocol. It's the very architecture of the protocol. As the secretary said, the details -- the regulations, the refinements -- need to be worked out in Buenos Aires, but the architecture is one of flexibility in trading.

So, rather than say, "Well, there won't be trades," I think we should all join and use our energies to make sure that the trading system comes off without being fettered and hindered. That is our best hope. If the price ends up higher than we think, farmers will benefit, 'cause they'll be able to put woodlots in and lengthen the rotation of trees. I think, though, the market will work, the price will be low, and we'll all -- lower than expected, as it was with sulfur.

LUGAR: Yes. Miss Novak.

NOVAK: You know, we hear about these 2,000 scientists worldwide, and I only have one thing to say about that. That study's pretty old, and even the peer review is pretty old. A lot has happened over the last five, six, seven years.

LUGAR: When was the science done?

NOVAK: 1991?

LUGAR: The study.

NOVAK: The agreement was '91, so it was -- it's pretty old. And I think that if we really are thinking at all about going forward, we ought to have another one. We ought to contact all 2,000 of those people again and say, "Here's the latest everyone. What do you say now?" Because so much has been discovered over the last five, six, seven years.

So I think before we go one step forward, I think the U.S. Congress should ask for a recount. What's going on with the science?

LUGAR: That's a fascinating suggestion, just to interrupt you a moment, either Congress or one of you, one of your groups. You, it's sort of like polling a control group in a political campaign. You go back to the same 300 people in tracking and sort of

how they changed their minds. If you could find the 2,000 persons, presumably, even some news organization -- the Associated Press, the United Press -- where they might go back to the 2,000 and say, "Do you still feel the same?"

Is that what you're saying, or do we want a more detailed view? I don't know they ...

NOVAK: I believe the IPCC ought to have a recurring -- you know, if we're going to be looking at global climate issues, as under the U.N. mandate, there has to be some mechanism for updating the information as we move forward.

KRUPP: Well, there is in the protocol. It allows for scientific updates. And the same Intergovernmental Panel on Climate Change is now doing an update, and it will come out in a little over a year from now.

LUGAR: A year from now?

KRUPP: A year from now.

KLECKNER: Senator, I'd also add that those 2,000-plus scientists that signed on -- I really wondered often why some of them signed on, because they had so many caveats individually that, in essence, they were saying, "We don't believe some of this," even though they did, in the end, sign their name to it. I don't understand that, but they did their name.

But I think Ms. Novak's approach -- it's probably what you just said, Fred -- was it 2,200 or whatever it was? It was more than 2,000 to do it again. Some of them would be dead, but there would be -- they could be replaced.

LUGAR: Well, maybe there ought to be more rigor in the question that was asked ...

NOVAK: Right.

LUGAR: ... of these people. You know, for example, many of us in the Senate have comprehensive bills -- we're dealing with one now on highways. Now, in the course of this, there may be tens of amendments. We vote for some of the amendments, against some of the rest of it. At the end of the day, you have to decide whether you want to vote for final passage, whatever came of all of this or not, you know.

If the scientists had that sort of a problem, that's sort of one question. But maybe, on what we know now, the questions that we have about this, maybe we'd break this down into sub-questions that give us a better illumination of where their consensus may be.

Now, that's an interesting query, and that's the value of these hearings, to think of interesting things. Yes?

NOVAK: I have another comment. We also talk about these SO2 allowances, and, you know, what this is going to do once we get into a global emission trading system and everything. And, of course, as those of us who live through this realize is that we discussed SO2 and controlling SO2 a good 20 years before we passed the Clean Air Act amendments of 1990.

And, as one of the economists that did come up with a fairly high estimate, I have to say one of the things that, in viewing the high estimates -- the \$1,000-plus estimates on those emissions -- those numbers were put together when targets were tougher and timeframe was considerably shorter. And when Congress looked at those numbers, they said, "Let's reduce the targets, let's extend the timeframe. Give industry time to work this out."

And, finally, in looking at those numbers, they said, "You know, we recognize another problem here, ~~that the electric utility industry~~ can accommodate this if we unfetter the railroad industry so that we have the opportunity to use some of our low-sulfur resources more efficiently." And that -- that follow-on legislation is what has really kept the cost of those emissions down.

We did that within a sovereign nation. The concept of looking at the SO2 program and applying some of the lessons we learned there to a global system is pretty far-fetched.

LUGAR: This stimulates a question, without knowing where this is. But if, in fact, as you say, freeing up the railroads to haul the coal made that much of a difference, are there aspects, in terms of decontrol or movement toward market in our own economy now that would be helpful with regard to the problem we're discussing today?

NOVAK: We have an enormous capability of fuel-switching and technological progress. The issue is what is economic. What is the price signal that people are responding to and how do they view it? And today's fuel choices respond to today's fuel prices.

LUGAR: Agreed, but I'm just obviously querying, you know, whether there are blockages somewhere that change the economics. Yes, sir?

KRUPP: I've had the good fortune, over time, to talk to many of the folks who run large utilities -- the American Electric Power Companies, PacifiCorp (ph), Southern Company and others. The American Electric Power Company has bought carbon -- sequestered carbon at something like 37 cents a ton, I believe. They are buying their own insurance policy.

But, understandably, one of the blockages right now is that when a big company considers making a fuel switch -- say, from coal to natural gas -- will there be that second bite of the apple later? So guaranteeing people now that they'll get credit later -- they'll be protected for doing what might be the right thing now -- we would be bending that curve, business-as-usual trajectory down sooner.

And by doing that, as someone who cares about the economy, as we do on this panel -- by letting the markets operate now, early, we'd be insuring a soft landing, and that soft landing is mighty important for our economy.

NOVAK: We're pre-guessing the Kyoto Protocol again. A company making a decision between coal and natural gas has to view the prices under business as usual. They face the risk of having that -- you know, the risk or opportunity ...

KRUPP: No one would force them. No one would ...

NOVAK: ... under the Kyoto Protocol being ratified and being effectively implemented. But the choices being made today recognize not only fuel prices today, but the potential risk associated with each one. So it is an economic decision.

KRUPP: All I'm saying is allow people who voluntarily want to make a fuel switch -- allow them to protection to know that at least they'll get credit for that.

NOVAK: I'm not interested in buying carbon credits. I'm not interested in having the U.S. buying carbon credits ...

KRUPP: You may not, but -- you may not but ...

NOVAK: ... until we've decided that we are going join in a total effort.

KRUPP: You may not, but today's Suncorp (ph) did and, last year, AEP did.

LUGAR: Mr. Strange, do you have a final comment? You've not been able to jump into this.

STRANGE: Well, just again, the -- I mean, there is a market for everything. There certainly is a market for risk with respect to the issue of whether the science is right on this, and perhaps it would be of value to get some insurance company executives here to talk about the casualty premiums and maybe some crop insurance people to talk about what's happened to crop insurance premiums because I think you'll find that they factor in the risk of catastrophic losses due to extreme weather events.

And, as I testified earlier, I think that, from agriculture's perspective, the main risk here is not a warming, per se, on average, but increase in the extreme events associated with crops.

LUGAR: I'm simply curious, stimulated by that last comment, and out in Nebraska, what odds are you giving to farmers on crop insurance with regard to El Nino and drought this summer?

STRANGE: Well, Nebraska is a state, of course, that is famous for coping with extremes. At the western edge of the Great Plains is

re the sub-humid prairies turn into the semi-arid plains, and, you
, we have lived in the adverse conditions that you all in Indiana,
Mr. Chairman, will have to be dealing with if the worst eventualities
of global warming occur.

LUGAR: I see. Well, that's an ominous job.

STRANGE: We're very comfortable with the role, but we don't wish
it on you.

LUGAR: Thank you. I appreciate very much all of you coming.
Your testimony has been very helpful as well as your responses, and
the interplay among the panel. And this hearing is now adjourned.

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