THE BROOKINGS INSTITUTION

"CLIMATE WEEK"

CLIMATE TAKES CENTER STAGE

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Introduction:

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Moderator:

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Panelists:

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P R O C E E D I N G S

MR. TALBOTT: -- Carlos, over to you.

MR. PASCUAL: Strobe, thank you very much. Many of you came for an event on climate change, but it is also a real pleasure to be able to use this as an opportunity to launch our Energy Security Program at Brookings which as Strobe indicated to you is going to make an effort to address questions related to security, to economics, and to the environment and how they interrelate with one another and the complexities that are involved.

I will just take one second if I might to mention a couple of other events on our Program on Energy Security that are coming up. One will be on October 15 when we have a launch of a new book that David Sandalow has just written called "Freedom from Oil." I will talk about that a little bit further later. On October 17, I doubt any of you will be there, in Idaho we will have an event that focuses on oil dependence and the international framework related to climate change. I just mention it because what we are trying to do is take these discussions out to the wider country because these are issues that are not just Washington questions, but need an understanding more broadly in the political sphere and in the context of the different parts of our country that are going to be affected by political and economic choices.

Then on October 30 as a joint venture between our Energy Security Initiative at Brookings and the Hamilton Project, the Hamilton Project

has put together a tremendous event on October 30 that will start at 9 o'clock that will focus first on questions related to the pricing of carbon looking at issues such as carbon tax swaps and cap and trade systems may not seem like a naturally exciting topic, but for anybody who is involved in these issues, I think you are going to get some of the best debate possible on these questions with people like Rob Stavins, Gail Metcalf, and Larry Summers, and then a discussion that is going to focus on technology-related issues. So that is just a little bit of a foretaste of some of the things that we will have coming up. There is a flier on the Energy Security Initiative which is available. I hope all of you have it. You will see at the bottom of it Lea Rosenbaum who is our project manager and a point of contact. You will be able to get information on these events on our website, and our website is soon to transition to yet a bigger website so if you have had a few problems with it, do not give up immediately.

Today we really have an opportunity to focus attention on an issue related to climate change, and there is a very specific reason why. Next week there are going to be three absolutely huge events related to questions of greenhouse gas emissions and climate change. One of them will be at the General Assembly hosted by the Secretary General, 75 heads of state, I am not sure how many other countries attending, and that will address attention to the wider question of where we go on climate change and how can countries bring their views together.

The second will be here in the United States hosted by the State Department, proposed by President Bush at the G-8 Summit in Germany this past summer, and it will bring together major economies that are principally responsible for the vast majority of emissions in the world and if these economies cannot agree on a way forward, it will absolutely impossible to address these kinds of questions. So what kind of platform will that create for the future?

And the third event will be with the Clinton Global Initiative. That will focus attention on the issues of climate from the bottom up, in effect, the kind of pressure that comes from civil society and industry that, one, makes it possible to achieve many of the technological changes, but keeps all of us and our governments honest.

As Strobe has said, this is really an existential issue that is at the core of the viability of the plant. When we read reports on climate change and its impacts, what it can do to flooding and desertification, its impact on crops, its impact on disease, the possible impacts on conflict over resources, one would think of course this would focus attention and result in viable solutions. Then we get into the complexity of the question, and it does not mean that the focus dissipates, but suddenly we are in to realities that anybody who is emitting greenhouse gases has them joining together in the atmosphere, so regardless of where the emission comes from, it has an impact on everybody.

We have temporal questions that most of the benefits are in the future but the costs are today. We have a problem that has been created

principally by the industrialized world, the principal emitters of carbon in the future are going to be from the developing world and they are wondering why is it that we should restrain ourselves if in fact somebody else actually created this problem.

If we start aligning policies with technology, we start to find that there are actually huge gaps to achieve the kinds of outcomes that even the widest range of scientific projections have suggested are necessary. Then if we think about what the formula is to actually achieve some of those technological changes, we inevitably have to come to questions about the pricing of carbon because if you do not price it, why should anybody innovate. And of course, the minute that you start imposing those prices, we all come back to our domestic constituencies and we ask the question of what industries and what labor groups are affected and how do you deal with those kinds of questions. It is this complex network that is going to have to be dealt with in national policy and in international policy, and it is in this context that we really have this panel today and I am sure that they will resolve all of these questions for us in the debate that we have today.

We are very, very lucky to have an extraordinary panel with is, and the first of the people I will introduce is the Executive Security of the U.N. Framework Convention on Climate Change, Yvo de Boer. Yvo began his career on climate in 1994 at that point in the context of the Kyoto Protocol. He has been involved in the negotiations in Kyoto, he has led the E.U. delegations to the

UNFCC, and he has been a senior official in the government of the Netherlands dealing with issues related to the environment as well as other questions. And one of the things that he particularly brings to this debate is the focus that he has placed on bringing into the equation all of the stakeholders. In the UNFCC context, he has been one of the people who has focused on clean development mechanisms, in other words, partnership arrangements between countries in the North and developing countries in which they can actually work together on joint projects to achieve projects that can mitigate the impacts of environmental damage.

He has also worked very closely with the World Business Council on sustainable development and trying to involve the private sector. So from both perspectives I think he will be able to give us an important perspective on the role of those stakeholders.

Our second speaker today is Harlan Watson. Harlan also is a Ph.D. in solid-state physics and we will give us a technical platform which to address us as well. He is currently the Senior Climate Negotiator and Special Representative at the U.S. Department of State and he has been the alternate head of the U.S. delegation that has gone to the Conference of the Parties of the U.N. Framework Convention on Climate Change. He has been deeply involved on these issues since the joined the State Department in 2001, but before that in 16 years in the U.S. Congress where he was with the U.S. House of Representatives Committee on Science, and for 6-1/2 of those years he was the Staff Director of

the Committee's Subcommittee on Energy and the Committees on Energy and Environment.

Finally, our last speaker will be David Sandalow whom we have mentioned already. David is a Senior Fellow at the Brookings Institution. He was the Assistant Secretary for Oceans, Environment and Science during the last part of the Clinton Administration. Before that he was a Senior Director for Environmental Affairs at the National Security Council. He has a long career in this issue and one of the things that I would just mention a little bit more about because I think it is a tremendous product and it is reflective of the kind of work that Brookings does, a book that will be coming out on October 15, "Freedom from Oil." If I can just mention two quotes of praise for this book. One comes from Bill Clinton who says that it is a, "Compelling analysis of one of the great challenges of our time." But in a truly bipartisan approach to this, Senator Lugar, who also said that, " 'Freedom from Oil' should be required reading for all concerned citizens and elected officials." So I hope you will give the book a lot of attention when it comes out on October 15 because of the seriousness of the issue and the attention that it pays to questions of energy policy. And if nothing else, David has at least brought us the best prop for the day which as Strobe said is sitting out front, and I hope you take a look at it.

So with that, let me come back to Yvo de Boer and ask him to kick off our discussion today. Yvo, you have a tremendous job ahead of you over the

coming week, and we interested in hearing more about what your goals and objectives are.

MR. DE BOER: Thank you, and good morning, everyone. What I wanted to do was talk to you a little bit today about where we are in the political process on climate change at the moment, and perhaps more importantly, where we need to go in the political process on climate change.

If I look back over the past year, the sense it gives me is there is now an overall acknowledgement that we need to come to a more comprehensive international climate change policy approach beyond 2012. And I think there is also a growing agreement that a post-2012 policy needs to be inclusive, cooperative, global, and most importantly, embedded in sustainable development which is ultimately what we are working toward. I believe it needs to accord importance to both adaptation and mitigation and include technology as a key component of the solution. It must involve strong commitments by industrialized countries who must continue to take the lead in reducing emissions, given the historical responsibility for this problem which was referred to just now during the introduction, and I believe they also have a responsibility and an important role in helping developing countries come to grips with this issue as well. As was indicated earlier on, we will soon be in a phase where developing countries will be emitting more greenhouse gases than industrialized countries, the overriding concern of those developing countries is economic growth and poverty eradication, and that means that we must find cooperative international

mechanisms that will allow those developing countries to act on climate change while respecting those poverty eradication goals.

What have we got at the moment, and where are we? First of all, I think it is important to point out here that prior to President Bush's State of the Union Address earlier this year, chief executives of member companies of the U.S. Climate Action Partnership urged the President to support a mandatory cap on greenhouse gas emissions, to cut them by more than 60 percent by 2050, and that is very similar to the business voices that you hear in Europe, in Australia, and Canada, with the private sector calling for long-term clarity, a clear indication of where governments intend to go, a clear perspective on the policy environment within which they will have to make their investments.

Another important development that I have seen in this particular country is the way in which a large number of states have come together around the question of climate change, greenhouse gas emissions, have put in place cap and trade regimes, and together those states in fact account I believe already for about 24 percent of U.S. emissions. So you see a growing consensus at the level of the states that this issue needs to be acted on, but also those states turning to cap and trade as what they feel to be the most-effective instrument to address this issue.

The third thing I would like to mention is the fact that at the moment in the Senate, in the Congress, there are 12 legislative proposals on climate change on the table and eight of those proposals have an international

component of one kind or another. So that is another clear indication to me of a political desire to move forward, and of a political desire to do that in an international context.

Finally, in terms of U.S. action, I would like to mention that the National Governors Association this month said that they want to expand state regulation for limiting greenhouse gas emissions, and also announced a task force to advance clean energy development. So those I think are some very significant developments in your country over recent months.

Then let me turn to the international level and see what we have under the auspices of the United Nations. First of all, we have the Kyoto Protocol which 175 countries have ratified and which covers 61.6 percent of the greenhouse gas emissions. That is significant because I think you often hear that only a small number of industrialized countries actually have legally binding emission reduction targets under the Kyoto Protocol, and what is often forgotten is the fact that all countries that are signatories to the protocol are obliged to undertake projects and policies to reduce their emissions of greenhouse gases. So although the legally binding component of it is limited, the scope is in fact a global one.

The Kyoto Protocol involves a bottom-up flexible approach. It does not attempt to impose targets. It does not attempt to impose a particular policy approach. In fact, it leaves it free to countries to decide themselves or together as in the case of the European Union how they want to put in place the

policies to achieve the goals that they commit to. The Kyoto Protocol has succeeded in creating a carbon market and a toolbox for countries to meet their targets in a cost-effective way. In 2006 the carbon market grew in value to an estimated $30 billion, three times greater than the previous year. Approximately $25 billion was generated by the European trading scheme operated by the European Union, and another $5 billion through the Clean Development Mechanism which involves cooperation with developing countries and joint implementation which involves cooperation with transitional economies.

The Clean Development Mechanism is expected to result in emission reductions equivalent to 1.9 billion tons of CO2 at the end of 2012, and that amounts about to the annual emissions of Canada and Greece together to give you a feeling of the size. Activities in the CDM pipeline alone are estimated to have generated investments of about $25 billion in 2006, so you see what you might call a relatively small amount of carbon finance in fact catalyzing much larger commercially sound investments toward both the sound economic goal and the climate change goal.

Despite these important advances, you will also have noticed that the latest science clearly tells us that more action is needed than we have in place at the moment, and where are we on that at this moment in time? The average global temperature rose by 7.4 degrees centigrade during the last century, the largest and fastest warming trend in the history of the Earth that scientists have been able to discern. Current projections show that trend will continue, and will

accelerate. In the 21st century the Earth could warm by about 3 degrees centigrade. The Intergovernmental Panel on Climate Change is certain that climate change is unequivocal and that the largest part of the warming is caused by human activities. The political answers to the science must now urgently be provided.

There have been encouraging signals that there is a growing political momentum developing, and I would like to mention here three. The first, and it was referred to in the introduction as well, is the very important outcome of the G-8 meeting in Heiligendamm early this year where the G-8 put together an ambitious work plan and tight timeline for negotiations in a future climate change regime to be completed by 2009 and the instruments to address climate change, particularly the carbon market and its role in creating economic incentives for developing countries to act on climate change. Also encouraging is the fact that the G-8+5, so the five large developing countries, called for the means for adaptation to be included in a future agreement along with enhanced technology cooperation and financing. So that really is pointing toward a global approach that does not just focus on reducing emissions, but also focuses on adaptation which is going to be particularly critical to some of the poorest countries in the world.

Also in the context of that process, Japan and the European Union called for emission reductions of 50 percent by mid-century. And as you know, the European Union put an offer on the table to reduce its emissions by 20 percent

in 2020 and go to minus 30 if other countries join. What I find significant there is that that minus 20 offer stands whatever happens, and that I believe is a very important signal to developing countries that are looking to industrialized nations to take the lead that the Europeans are willing to take.

Another important development I think was in the context of the so-called Vienna Climate Change Talks which happened in August where parties to the Kyoto Protocol agreed to work based on a range of emission reduction objectives for industrialized countries of 25 to 40 percent below 1990 levels which is actually in line with the most stringent scenarios of the Intergovernmental Panel on Climate Change, and this range will be used as a reference in the context of future work under the protocol.

The third important development I would want to mention is the Gleneagles outcome, the process that was established by the United Kingdom's presidency of the G-8 which clearly shows that countries are willing to move forward, and that process I think is an important contribution to laying the foundation for launching a comprehensive agenda on the future at the United Nations Climate Change in Bali in December.

These are encouraging signs that countries are willing to move forward with a renewed sense of urgency, and important examples of this are Brazil and South Africa which in the negotiations have been calling for an end to informal talks and the beginning of formal negotiations on a long-term climate change regime.

Why this need to move forward with such urgency? Let me mention a couple of issues here. The first one relates to access of energy which is one of the overriding developmental concerns of developing countries since economic growth demands increased energy supply. Secondly, energy is crucial for economic development. In many of the least-developed countries and small island developing states, energy services fail to meet the needs of the poor, and 1.6 billion in developing countries still do not have access to modern energy services, and 2.4 billion people still rely on unsustainable traditional fuels for their cooking and heating needs.

Thirdly, according to the Reference Scenario of the International Energy Agency, global energy demand will grow by 60 percent by 2030. In the period up to 2030, the energy supply infrastructure worldwide will require a total investment of $20 trillion with about half of that in the developing world. A substantial proportion of global energy investment is required simply to maintain the present level of supply. Oil and gas wells are depleting, power stations are becoming obsolete, and transmission and distribution lines will need to be replaced. In total, 51 percent of investment in energy production will be needed simply to replace or maintain existing and future capacity. The remaining 49 percent will be in capacity to meet rising demand.

The way in which these energy needs are met has the potential to impact either positively or negatively on climate change and sustainable development goals. The challenge is for both national and international climate

change policies and actions to play the determining role in the globally greening of energy supply and economic growth. Along with policies, shifts in investment and financial flows to more climate-friendly and climate-proof investments in energy are needed.

Some $432 billion is projected to be invested annually in the power sector. Of this amount, $148 billion will be shifted to carbon dioxide capture and storage, renewables, nuclear energy, and hydro. Investments in fossil fuel supply is expected to continue to grow but at a reduced rate. Or to put it simply, we will be spending over the next 25 years $20 trillion to supply the energy that is needed for economic growth. If we do that unwisely, greenhouse gas emissions will go up by about 50 percent, and if spend it wisely, emissions could go down by the 50 percent that the international scientific community is calling for.

What is that scientific community telling us at the moment and in the context of its most recent report this year? First of all, that between 1970 and 200r, emissions of greenhouse gases have increased by no less than 70 percent. Secondly, that without concerted global action, greenhouse gas emissions are projected to increase by between 25 and 90 percent by 2030 relative to the year 2000. And thirdly, to abate this trend, global emissions must peak and decline thereafter to meet any long-term greenhouse gas concentration stabilization level in the atmosphere. The lower the stabilization level that is chosen, the more quickly this peak and dip must then occur.

According to the most stringent scenario of the Intergovernmental Panel on Climate Change, a long-term goal in line with the latest science would include, one, a peak in emissions in the next 10 to 15 years; secondly, a decline of 50 percent over 2000 levels by the middle of the century, and this would stabilize emissions at around 450 parts per million of CO2 equivalents in the atmosphere and correspond to about a 35 to 36 degree Fahrenheit rise in temperature. The urgency of the situation I believe is driven home by the IPCC's projected effects and these include such issues as crop yield reduction in tropical areas, increased risks of hunger with perhaps half of the African population being confronted by water stress, and an increase of extinction of 20 to 30 percent of plants, animals, and species.

Decisive action in the next decade can still avoid some of the most catastrophic scenarios that the IPCC has forecast. A strong climate change framework needs to be in place by 2009 or 2010 in order to ensure that there is no gap between the end of the Kyoto Protocol's first commitment period and the entry into force of a new regime. That is important for a number of reasons including to give confidence to the carbon market that policies will continue to move forward.

To achieve all of that, I believe that a breakthrough in the form of a launch of a comprehensive agenda on the future is needed at the U.N. Climate Change Conference in Bali so that in Bali in December of this year governments decide to formally launch negotiations, that they agree to the building blocks of

those negotiations must focus on, and that they set a deadline for 2009 or 2010 when those negotiations must be completed. That is the agenda that we have ahead of us and that is the agenda which we cannot achieve without the help and consensus of the United States and other countries from around the world. Thank you very much.

MR. PASCUAL: Yvo, thank you very much, and let me call Harlan Watson to the podium. Harlan, I will be very excited to hear your perspective on how the U.S. then fits into that wider picture.

MR. WATSON: Thank you very much, Carlos. Thank you all for coming.

What I am going to do is to talk about what we intend to achieve next week here in Washington next Thursday and Friday which will be the first of what President Bush has proposed, a series of meetings of major economies. I was going to have a little background and set the stage. There is a broad set of principles of course which Yvo referred to, but certainly I think as Carlos mentioned early on, the importance of addressing climate change and energy security and really economic growth as a bundle, as a package. As Jim -- would say if he's here, and I apologize for Jim, he had an urgent meeting this morning, Jim would say you pull on one lever, it impacts one of the others and so you really need to address these obviously as a package, and certainly Yvo put up the importance of economic growth, the importance particularly in addressing the 1.6 billion people without access to modern energy services, the overriding priority of

course that developing countries place on poverty reduction, and of course the importance actually of economic growth to developed countries also.

So here are a few of the principles. They were essentially embodied as Yvo and others have said at the Gleneagles in 2005, dialogue has continued most recently in Berlin and will report out to the G-8 presidency in Japan next July. One of the things that perhaps did not get that much coverage here in the United States was also that the 21 leaders of Asia Pacific Economic Cooperation also agreed 2 weeks ago in Sydney at the leader's summit to a set of principles which actually echoed many of these same points, I believe seven or eight of the major economies, and that does include China, Japan, the United States, Canada, and many of the others that will be involved in the major economies' meeting, a very similar set of principles, and I think that obviously Yvo captured those very well. The basic set is very well recognized and I think at this point has general endorsement by most of the major economies. Of course, it is going to be getting down to the details which will get tricky.

Let me go on to the next slide, please, and let me talk then about what we intend on hopefully accomplishing beginning with the meetings next week and then continuing on throughout the 2008 timeframe. Again, as Jim Connick would say, we are getting beyond I think the conceptual at the 100,000 foot level, and want to get down to a kind of roll-up-your-sleeves stage. So we really want to get away from the dialogue, dialogue is nice, but we really want to drill down and see how we can really construct new architecture for what happens

after the first commitment period of Kyoto ends in 2012 and again how to do that in the context under the United Nations Framework Convention on Climate Change.

We will have major economies next week that include the listing there, so we have a group of 17 economies with the United States included. Plus the United Nations will also be represented. One of the things we want to do is to launch a process to establishing a long-term global goal for reducing emissions. You have heard the figures out there. The challenge is daunting. If you just do the arithmetic of what is contained in Article 2 of the convention itself, the ultimate objective of the convention is to stabilize atmospheric greenhouse gases in the atmosphere, and of course that is daunting. If you just do the arithmetic, something to the order of 50 to 60 percent is going to be required for that. Of course, the pace and timing of that and ability to sustain economic growth, prevent dangerous -- interference with the climate and so on is going to be a great challenge.

Of course, as Yvo mentioned in his talk, three have proposed long-term targets. The E.U., Canada, and Japan are talking about an aspirational goal of 50 percent reduction by 2050, and we will be considering those in this context. I might note I believe that the U.K. is actually talking about putting into law a requirement that they reduce emissions by 60 percent by mid-century. Some of the countries in this group of course have committed in principle to try to reach an agreement or consensus on a long-term goal, some have not, and I do not want to

single out who has not, but all have agreed to at least discuss the issue. That may not seem like much, but I think it is really a big deal that actually the participants have agreed to consider this.

Second, we are going to try to flesh out the current situation on national strategies for addressing greenhouse gases and improving energy security with a view toward shaping national portfolios of action post-2012. Right now of course the European Union, Canada, the United States, Australia, and others have already begun to define post-2012 national policies. What we are talking about then is what we need to do in the midterm, the 2020 to the 2030 timeframe, and Yvo did mention the offer from the E.U. Then we need to design that at a national level because each of the major economies in this process does have a different national circumstance. The effort here then will be the recognition that we expect those strategies would include binding elements certainly such as in the United States we have mandatory fuel economic standards, we have of course mandatory renewable fuel standards both at the federal level and many of the states. But it also would include many other features including incentives for technology partnerships and other hallmarks of cooperative action such as voluntary programs which Japan has and things like climate leaders for example in the United States. We then intend to focus on key sectors in technology areas of priority. Much of the future growth of course in emissions is going to come from the power generation sector and particularly from coal-fired generation, and probably the second most growth amount that is projected is the use of petroleum

in transportation and so we really want to hone in on the low-carbon fossil generation and particularly the carbon capture and storage issue, again, vehicle and fuel technology.

The third area of course is important and this has begun to become addressed in the UNFCCC, discussions have particularly avoided deforestation in developing countries, and the whole bundle of land use change including forestry and ag is about 20 to 25 percent of emissions, so that does need to be addressed. Then we want to look at really accelerate market penetration of existing technologies, energy efficiency technologies, nuclear, solar, wind, and so on. We also want to put a particular interest on technology development and transfer. IAEA The figures for global energy R&D indicate I believe that Japan and United States account for well over half of current energy R&D that occurs on the global and that actually globally at least within the IAEA countries this amount has been going down in real terms and we think it is going to take a significant increase. So one of the things that we will certainly want to promote is the increase in this funding both at the national level and then cooperatively. Of course, one of the easiest things to do to accelerate the transfer of the existing clean energy technologies is to eliminate tariffs and other nontariff barriers to clean energy and environmental goods and services. This has long agreed to have been addressed within the Doha Round, it has repeatedly been enforced both in the G-8 context and actually at APEC 2 weeks ago, and hopefully we will have some movement on that by the end of 2007. Obviously this is going to be a difficult issue but we

really think that we are inhibiting the flow of literally billions of dollars in clean energy technology. Of course, as President Bush mentioned in his May 31 speech, he really wants to launch a global effort on examining how we share government development in known technologies at either low or no cost. This is a particularly important issue to developing countries, this has been the point of many discussions within the framework convention and we hope to move on that. Then of course, addressing energy efficiency which has so much near-term potential, again, through enhancing new partnerships among the major economies. Finance is of course another cross-cutting issue. I might mention technologies are not only important for mitigation but also for adaptation. And of course, finance is a very important component, very much a cross-cutting issue, again a topic of discussion with the UNFCCC. Again we want to focus on the existing government and private resources on how we might best leverage these and also consider new low-cost capital sources to finance investment in transformational technologies, engaging development banks, OPEC, and here in the U.S.

And then the rather mundane topic of course of harmonizing emissions monitoring systems. These are very good I would say the national level, but when you start drilling down to the entity-wide level and really see how people do things, there are some significant differences. So we really think it is important to try to harmonize these accounting systems so that we can really determine if we are making progress.

Of course, the question has arisen again and again on how this all fits into the UNFCCC agenda. Is this competing? The answer is absolutely not. The G-8 leaders themselves are very much committed as in paragraph 53 of the Heiligendamm Leader's Statement to reach an agreement by the end of 2008 and bring that to the UNFCCC to forge an agreement hopefully in 2009. But we do hope to report out on at least the initial meeting, and I might say in the initial meeting we are not going to solve all these issues obviously. What we want to do is to set up processes, we want to set up work teams composed from the major economies again to really drill down into these areas. Much of what we are doing here and much of the discussion is going to reinforce existing UNFCCC agenda items. We are very focused on adaptation in the major economies' process, but of course the financing issues are going to certainly be an important component in addressing adaptation. We also want to hopefully accelerate progress within the discussions which will occur at Bali. Of course, we are addressing development transfer technologies, again a major topic of discussion, the deforestation issue, and reducing those emissions in developing countries and the whole topic of capacity building.

I will stop there and will be happy again to take any questions you have on this, and thank you very much for this opportunity. Thank you.

MR. PASCUAL: Harlan, thank you. That was very helpful in understanding what your agenda is this next week and how it fits into the broader

FCCC framework. Let me ask my colleague here at Brookings, David Sandalow, to come and comment on these and provide his own thoughts.

MR. SANDALOW: Thank you, Carlos, and thank you Yvo and Harlan.

Working on global warming can be a pretty sobering experience sometimes, so when I go home my favorite magazine is the "Funny Times." If you do not get the "Funny Times," I recommend subscribing to it. It is a monthly anthology of humor. It had an article in it recently about obvious headlines. For example, "Man Killed. Police Suspect Homicide"; "Police Raid Gun Shop, Find Weapons"; "Larger Kangaroos Jump Farther, Study Finds"; my favorite is "Prostate Cancer More Common in Men"; and "Islamic Center has Muslim Tied" So one obvious headline over the course of the past decade has been "Last Year Set Temperature Records."

Just this morning another story that may strike many as obvious that they have seen before, "Arctic Ice Receding at Record Levels." Ladies and gentlemen, we face a climate crisis. It is unprecedented in the nature of human history. It will require as Strobe has already said unprecedented amounts of cooperation in order to solve. It will require all of us to draw both upon new forms of analysis, new forms of cooperation, and new forms of goodwill.

I would throw out just quickly two principles it seems to me we must follow in the decades ahead as we work to solve this problem. First is that we must use all available tools. This problem is so far reaching and so broad we

do not have the luxury of relying simply on one category of solutions, we must try many things. There are a lot of different ways that one could slice this, but it seems to me that we must for example rely upon individual action. There has been an outpouring of attempts by individuals over the past several years I know in this country and in others to figure out what they can do to help solve this problem, and that is going to be an important part of the solution.

We have to rely on corporate action too. There has been the same thing, an outpouring of companies looking at new ways that they can make money by helping to engage in solving the climate problem both by cutting costs and by finding new market opportunities.

We are going to need to rely on national-level action, and I believe that climate change policy begins at home and that in order to solve this problem, national governments must lead and that what we have already seen in some countries around the world has been an essential part of the solution and it is going to continue to be. And we are going to need to rely on international action. Obviously global warming is a global problem and different forms of international cooperation are going to be required. So we must use all available tools.

I also think as a second principle we must learn from experience. It would be shocking if the first efforts to solve this problem were perfect and completely successful, and as somebody who was involved in the Kyoto negotiating process let me say that one was not, nor will future ones be, and it

seems to me that the goal of all of us should be not to get into debates about what went before, but to critically analyze what went before, what were its strengths, what were its weaknesses, learn from the strengths and weaknesses and apply those in future settings. So I say we must use all available tools and learning from experience is key.

Last year this month Sir Richard Branson stood on stage in New York with Bill Clinton and announced that he, Sir Richard, was going to pledge all of the profits from several of his businesses over the course of the next decade to investment in renewable energy for the years ahead. Sir Richard described how he came to this idea after a discussion with Al Gore who came to him and said, "Sir Richard, you are global leader on this problem and you can help make a difference." And he was motivated to actually decide upon his course of action by the opportunity to announce it on stage with Bill Clinton at the Clinton Global Initiative.

That announcement was just one of scores of announcements made at the Clinton Global Initiative last year, people who came together, partnerships that were formed, to help solve the climate problem. Next Wednesday in New York the curtain will go up on the third annual meeting of the Clinton Global Initiative and I expect more announcements. I have been working over the course of the past several months with sources of companies, NGOs, and others, some of whom who have come to me, for instance, last someone came and said our CEO left last year's meeting and said we just made a commitment that I think makes a

difference, let's do something bigger and bolder next year. What could we do? Those types of dialogues have gone on scores if not hundreds of times around the world and I think we are going to have some exciting announcements related to energy efficiency, related to renewable energy, related to public education, and others.

I think this is a big, high-profile example of a trend that is fundamental, which is the engagement of different types of civil society in solving this problem. In many ways, if you look back to Rio, Rio was a somewhat path-breaking way of engaging civil society in the solution to a global problem and that in the 21st century has continued to evolve. For example, at the Clinton Global Initiative we have a dozen or more heads of state, we have CEOs, we have NGOs of all different kinds, we have media, coming together to solve this problem in the 21st century type of format.

I think as we look at all available tools, this is exactly the type of thing we need to do. Our sessions will be live webcast. This by the way is a nonpartisan event, obviously with Bill Clinton at Democrat, Laura Bush opened our conference last year, this year we will have a plenary session where Secretary of the Treasury Hank Paulson will speak. So this is an effort to bring in everybody to help solve problems. In addition to global warming at our conference, by the way, we also take on the problems of poverty, health, and education.

Another example of this type of engagement by civil society has been a global leader's process pulled together by the Club of Madrid and the United Nations Foundation which has an excellent set of recommendations for how to go forward in the International negotiating process and I believe copies of their report are out on the back table and I commend it to you.

So there are two other meetings happening next week, and just some quick words about those, because it seems to me that all three global meetings next week include elements that are important as we shape a response to climate change. Starting on Monday we will have the high-level session convened by the Secretary General of the United Nations. This is an unprecedented gathering of world leaders to talk about this issue. Yvo can tell us, and others here, the exact count. Last I knew I believe it was 75 or more world leaders were coming together to talk about this issue. Among the reasons this is important is because global warming is such a cross-cutting issue. When I worked at the White House, one of the jobs of a White House staffer is to bring agencies together when they disagree and try to resolve differences on issues and on some issues you would call a meeting and two or three agencies would show up. When we called the meeting on global warming, everybody showed up because everybody has a stake in the global warming issue, so obviously the EPA, the Department of Commerce, the Trade Representative, the State Department, the Department of Agriculture, the Department of Labor, the Department of the Treasury, just think about it, the list goes on. Everybody has a stake in this issue.

One of the weaknesses it seems to me of the multilateral global warming negotiations has been that they are mainly attended by environment ministers and in many countries, environment ministers lack authority and so the engagement of heads of state in solving this problem is absolutely essential and what the Secretary General has done in convening this meeting is an incredibly important contribution and at the dawn of his tenure as Secretary General he is making an important contribution on this issue.

I believe that President Bush's meeting next week also contains a very important positive element which is the gathering of a subset of key countries to work on this issue. Getting major emitters together in the room to talk about this is a good thing. Tony Blair has done this before and I think the international trade liberalization regime proceeded over the course of 50 years with bilateral agreements, regional agreements, building up to a global agreement, and the climate change regime it seems to me can learn from that, and it is a good thing to get countries talking to each other and the U.S. and China account for more than 40 to 45 percent of global emissions. If the U.S. and China are talking with each other and entering into some type of an agreement, that can make a difference, and I think gathering subsets of countries together is highly desirable.

I think the focus on a long-term goal is useful as well so long as it does not distract from the focus on short- or medium-term action. It is very helpful to know in a broad sense what type of temperature targets we are shooting for or what type of concentration targets we are shooting for and it is a discussion

worth having. Having been involved in these discussions for many years, the potential for that conversation going on at length is considerable and so I would commend that conversation to negotiators and others everywhere so long as it does not distract from the critical effort to reduce emissions in the short-term.

Although I think there are some very important positive elements in the Bush meeting, there is in some ways I think a curious omission in the agenda which is the lack of attention to the carbon markets. The carbon markets have been a critical element of solving this problem. The irony here is that you can in some sense trace the intellectual linage of the carbon markets back to the first President Bush and some of his administration's embracing of emissions trading. Today I think it continues to be unfortunate that this issue is not being embraced. More fundamentally, the future of the global climate regime will be shaped in 2009 and beyond. I think the Bush meetings can have an influence to the extent that they genuinely engage and persuade the players who will be here beyond 2009 and so I think we will see over the course of these conversations the extent to which that happens.

I have a dream that some day an obvious headline will be "Emissions Dropping for the Tenth Year in a Row." I'll be happy to answer any questions. Thank you.

MR. PASCUAL: If I could ask the three speakers to come up front. While they're coming up, let me just mention a couple of things, one which I thought I had said but I probably may not have, if it was not obvious, among

other things, David Sandalow is also the head of the Energy and Climate Working Group for the Clinton Global Initiative and has been very much at the center of negotiating those kinds of commitments that he talked about earlier.

The other thing which I had realized I had said was that we are having an event in Idaho on October 17 and many of you were probably impressed with the interest of Brookings going to Idaho while everybody else is going to Iowa. We in fact are also going to go to Iowa as well, but it would have been a creative intervention. It is a new form of ethanol from potatoes.

In addition to our panel members, we also have another guest with us today who happened to be in town and is very kind to join us in our discussion today, and that is Nobuo Tanaka who has just taken over 3 weeks ago as the Executive Director of the International Energy Agency. As many of you know, the IEA is sister arm of the OECD and plays a critical role in setting up the framework and guidelines for conduct of international energy markets, it plays a critical role in driving efficiency technologies and sharing that information around the world, and I would like to offer Tanaka-san the opportunity to offer the first question or comment.

MR. TANAKA: Thank you very much. Thank you, Carlos. It is a great honor for me to come to this meeting and invited by the Brookings Institution. Before I was in Washington twice and always participated in these kinds of seminars and workshops and it is a great privilege and advantage of Washington because I always feel that this kind of policy discussion with

different sets of issues is always providing a really wonderful policy market so to speak. If you win the market, you get the White House, if you lose, you go out. So this competition of policymakers is a really fascinating feature of Washington. I always really enjoy discussion here and thank you for inviting me to come back and make some comments.

I am now in the IEA, the International Energy Agency. Many speakers used some of our numbers and it is a really wonderful thing. Our role is creating data, statistics, and making recommendations. We are often called the watchdog of the energy policy or energy crisis, and the doghouse is a wonderful place in Paris and quite many dogs who are really capable of getting information and data and analyzing and making recommendations.

For example, we are now moving into the efficiency business because efficiency certainly increases energy security by not using it. But also it is responding to the sustainability question, so we are now making recommendations asked by the G-8 summit meeting, 16 recommendations already made. Some of them you may quite well know, the phase out of incandescent lighting bulbs, and it certainly provides the opportunity of reducing, for example, 20 power generation plants. It is a great amount, 80 is a huge number. Another recommendation we are saying is stand-by power limitation. The U.S. government has already started for government procurement by limiting this stand-by power to 1 watt. It also reduces 20 power plants, totally just 100 power plants could be eliminated in this kind of initiative. But the problem already is

implementation. How you can implement this is the most important thing. I always claim implementation, implementation, and implementation, that is what we want to see happening, and the IEA is very much concerned about, as somebody said, the future investment for the capacity of energy. We say about $20 trillion is necessary, but how could it be spent is depending on government policies, in the power plant or in the demand side technologies, or something else. So this kind of decision of the government is very, very important for private sector investment and without that we cannot secure the future of the energy supply. So that is the policy stance which we have.

My question to the speakers is you are saying very right things as to the framework for the environment and climate change future, but how can we really make this investment or implementation possible? The government should really commit the policy to the future. Otherwise, no company can invest a huge investment for nuclear power plants. It is a long-term investment so it should be also decided very soon so the NIMBY issue, not in my back yard, is a very difficult thing. And also we have to set the price of carbon dioxide. That is another important infrastructure which is necessary for a quick decision. And R&D is also very important, but it is declining. Energy efficient efforts of all IEA countries have declined dramatically these days. It used to be in the 1970s and 1980s we improved annually 2 percent of energy efficiency, but now it is down to 1 percent. It is half. So how can we double our efforts is just a very important thing and it should be done quickly.

And on top of these issues, IEA is now doing the forecast or outlook for energy in the world energy outlook and the energy technology perspective which are coming to the end of the year to the next year. There we will make a scenario which possibly stabilizes the CO2 emissions as IPCC says for example for 50 ppm. In that case, a technology breakthrough is definitely necessary and very costly. On the other hand, probably that is not enough. We may need a kind of lifestyle change in the future. In Germany I know the political taboo is to limit the speed of the Autobahn to 100 kilometers. Even Germany did not do that in the Gulf Oil crisis. Can you do that? Certainly in the United States you have to switch from huge SUVs to hybrid even though it is expensive and relatively small. So can't we really move to that? And lifestyle change is another challenge. The IEA, yes, we are as I said, dogs should bite and we are providing very critical data and objective evidence and we want governments to decide on these facts and then that guarantee will warrant the future investment and security and sustainability at the same time. Thank you very much.

MR. PASCUAL: Tanaka-san, thank you very much. Let me come back to the panel then. Mr. Tanaka has put a question on the table about the implementation of efficiency technologies; he has raised questions about risk, about financing, about the price of energy, R&D issues, and Yvo if I could begin with you, what are your suggestions?

MR. DE BOER: I think my first and foremost one would be to send a clear political signal today rather than tomorrow because it is the political

signal that drives the investments in the market. China is building according to some people one new power plant every week, according to other people, two new power plants every week. Without a sense of policy direction, those will not be clean plants. Mr. Tanaka can also tell you that over the next 5 to 10 years we will be replacing worldwide 40 percent of the power generating capacity. That capacity is going to be around for the next 30 to 50 years. In the absence of a clear policy signal, there is no incentive to move in a clear direction. So I think my first and foremost point would be given the clear the political sense of direction today.

My second point would be do not invest in making it more expensive for yourself when it needs to be. The Intergovernmental Panel on Climate Change has said that we can reduce global emissions of greenhouse gases by 20 to 30 percent through measures that pay themselves back out of a lower energy bill in just 2 to 3 years. In other words, we can reduce global emissions by 20 to 30 percent for free. So my next argument would be to use the global market, allow the market to identify the most cost-effective options to reduce emissions wherever that may be in the world. Those would be my two first ones.

MR. PASCUAL: Harlan, do you want to pick up from that?

MR. WATSON: Yes, thank you, and thank you very much for the questions. I will start first with lifestyle change is I think the most difficult issue to get a handle on, and is of course fraught with danger for political leaders. I think it is just a matter of education. I think we are seeing in the United States a

slowdown in the sales of SUVs; we are going to smaller ones now, we are talking about hybrids and so on. That is just a matter of public awareness, but it is not something that is going to be done overnight certainly.

Let me just give you an example. You mentioned incandescent light bulbs, tremendous potential, but many, many people including my dear wife just does not like the light it puts out. It is not aesthetically pleasing to her. Over her objections I have still installed them most everywhere in my house, but it is also that personal preferences play a major role in that.

I think one of the quickest things that could make a difference is again reducing tariff and nontariff barriers to environmental goods and services. We have just have of course agreements and repeated agreements to do this within the Doha context, within the G-8, and most recently with APEC, and yet we see certain large entities imposing heavy duties for example on imports for fluorescent lights continuing for another year, some 66 percent duties that the European Commission just decided to continue. Again, the concern was the impact on jobs and particularly light bulb manufacturing in Germany. So it is an extraordinarily difficult issue and when it starts impacting jobs, it makes it very difficult for politicians to move forward.

Let me address the issue on carbon pricing. You know we are not particular fans of economic-wide cap and trade systems although we certainly do employ them and have employed them very successfully in our acid rain program and continuing in other areas in implementing the Clean Air Act. I would remind

you that there is an enormous -- there already is in the price of carbon embedded in fossil fuels today, there is a tremendous incentive at $80-plus barrel of oil to reduce that use. In fact, I think we are going to see an increase in energy efficiency which as you say has slowed down simply because society is going to react to that, it is going to take a while to turn over capital stock and so on. But once again, our major concern is on imposing yet another price increase on top of what has already happened and the energy market is really going to hurt the economy and we think that economic growth is absolutely essential, it is absolutely essential for political support, and it is going to necessary to address the problem.

MR. PASCUAL: David, do you want to pick up on this? You have just written a book obviously on the topic and you do not need to give us the full book in one shot, but this question of price is also particularly important and it is one of the ironies, if an economist were asking the question they would say you have to get the price right, if you want the right political signal, then let's put a $30 per ton price on carbon and we will start actually sending the right political signal and the world will start to respond. You bring that back to political realities and we get into the world that Harlan talks about where nobody wants to stand up and say we have a new tax, a tax on carbon that is good for the future, live with it, we will all be better off. How do you parse these issues?

MR. SANDALOW: The first point I would make is this is not about pain and suffering. I have been driving around this plug-in car for the past

little while which has got these garish decals on it, and the number of people who come up to me and say what is this, I am so excited, I could barely make it out to the lobby because the guys out front wanted to talk about it, as soon as these things are available people are going to just buying them as fast as they possibly can, and this is just one example.

Just recently my kids tell me I am probably the last person in the United States to do this, but I rented from Hertz a GPS box. I had never driven around with a GPS box before 3 months ago and I was driving around a city that I did not know and this box was telling me you need to turn right in 100 feet. I was thinking when I was a kid, it is not just that I did not have these, it is I never even thought about the possibility of having a box like that when I was a kid. Here I have something telling me where to go in a 100 feet and I was thinking, what is it that 20 years from now my kids are going to be saying the thing about? What is it that they are not imagining? And given all the attention that is going into the energy space right now, I think we are going to have remarkable breakthroughs in this area that are going to help us solve the problem.

I think if you wanted to pick one intervention that would make a difference, it would absolutely be putting a price on carbon. You could do that with a number of different tools. The emissions trading markets have been incredibly successful across a range of different pollutants over the last 20 or more years now, it is a well-tested tool. I think the view that this is going to be expensive and a burden on the economy is just not borne out by the facts, nor do I

think it actually is the view of most of the political forces in the United States today. I think in the Democratic Caucus there is broad support for this, and we have from Governor Schwarzenegger in California, obviously a Republican, to Governor Crist in Florida, to Governor Rell in Connecticut, as well as some very senior forces at the Capitol, broad-based support in both parties I think. I will say this; I believe that we are going to have binding cap and trade legislation in the United States in around the 2010 to 2011 timeframe. I think it is about an even money bet. If anybody in the audience wants to take me up on that, I will be glad to do it.

MR. PASCUAL: Thanks. Let me take two questions at a time from the audience and then I will come back to our panel.

QUESTION: I have a question for Mr. Watson. You said commit to national midterm goals with binding elements. In May -- used a different phrase which is aspirational goals. My question is, which is the policy of the government of the United States? Goals with binding elements or just aspirational goals without any commitment?

MR. PASCUAL: And let me take a question on this side over here.

MR. PATTERSON: Andy Patterson with Econergy. We are in the capital markets on all of these topics. My question to that and builds on Tanaka-san's points which is, aren't we focused on the wrong market? The real market for making the change is the capital markets more than the consumer end

product because that is where the real transformational change is going to be made. The consumer product markets have shown themselves to be very muted in their response, driving habits, electricity consumption, whereas combining your McKibbin-Wilcoxen approach with technical regulation and with capital incentives really sends the right signals as Secretary de Boer has been talking about, but it sends it to the right place which is the capital markets. The consumer markets frankly are very poor at responding to this kind of problem. What we need is to mobilize what Harlan has been talking about which is low-cost capital to really make the transformation. Thirty-billion dollars in the carbon market frankly is puny compared to the global bond market. That is where the change has to happen, not so much in the consumer price signals. So it is the price of carbon in the capital market.

MR. PASCUAL: Harlan, let me ask you to begin with the first question on binding midterm goals versus aspirational goals.

MR. WATSON: First, with regard to long-term goals versus aspirational, nobody I think with the exception of the U.K. has considered actually enacting these into statute. I think Canada perhaps is looking at that, and I think probably the U.K. is most serious. Aspirational, at this point we do not know how to get from here to there. In fact, if you would look on a scheme I think that Chancellor Merkel proposed in Japan actually at the end of August on somehow reducing per capita emissions by 50 percent, so you would reach a 50 percent global target and you spread that on a per capita basis, if you did the

arithmetic on that, you would be talking about 80 to 90 percent reductions in greenhouse gas emissions for most developing countries and also significant reductions for most developing countries from today, and we don't have the technology to do that. So I think again that it is very important to set this goal to guide investment to give us something to shoot at and to develop policies around that.

With regard to the midterm goals, we expect those certainly to have binding elements at the national level. We are too early in the process -- since we have an interesting group of economies that are in much different places on where they are willing to go. However, I think all of these economies do have binding elements at the national level and are already in place and are considering additional ones. So that is what we want to again start first.

I think the point on capital markets is very good. I am not sure though how much longer we are going to have low-cost capital given some of the turmoil in the international markets, but I think your point is taken very well and it is very hard putting that in the consumer market to get quick turnaround on it. It takes quite a while.

MR. PASCUAL: Yvo or David, do you want to comment?

MR. DE BOER: Yes. On that capital market question, I talked earlier on about $20 trillion being spent over the next 25 years to meet the world's energy demand and if spend that badly with emissions going up by 50 percent, for about $200 billion a year you can get those emissions to go back down to the

current level. Two-hundred billion sounds a lot, but in terms of the percentage of global GDP, it is peanuts. Since 85 percent of that $20 trillion is going to be coming from the private sector, directing financial flows in the right direction is absolutely what it is about, and that is on the one hand to my mind a question of using the carbon market to impossible investments possible, it is also a matter of putting in place legislation that drives investments in the right direction, and it is a matter of creating the right investment climate particularly in developing countries where so much of the economic change is going to be happening. So you are absolutely right that through market signals, through capital markets, through improving the possibilities for clean technologies to find their way into the market, is where the most important of the solution lies.

MR. PASCUAL: I think one of the interesting things that you mentioned there is that these questions about the long-term goals, the political signals, and the price questions are not divorced from the capital markets issue, that the clearer that those are as several of you have said, the most of an impact you're going to have on whether there are movements of capital and where that capital goes, and which countries in fact actually play in the system is also going to be a critical factor. If you have one group of countries adhering and let's say China and India are out of the system, what are the implications for investment and technologies that might actually perpetuate manufacturing with lower environmental standards? So I think those are other kinds of questions that are important to deal with as well.

MS. RIDGLEY: My name is Diane Dillon Ridgley and having spent part of my personal monthly carbon budget to come here from Iowa, I appreciate your correction. I really do agree with what was just said about the capital markets, and as David remembers well, I was one of Clinton's appointees on his Council on Sustainable Development and while we tried to address that, I want to talk about another side of the spectrum, for us to not think of it as a vertical, what is the most important, what is lowest but, rather, think about it more horizontally. Because on the other side of that, and what we are dealing with, this is my seventh presidential cycle in Iowa's caucuses, there has been more discussion and real tangible talk, commitment, and understanding on the part of the public about where we are and looking at energy connected to security in and across all of the forums and early caucus meetings and trainings that we have had in Iowa than I have ever seen in the seven cycles, but it is fragile and it is maybe only about a quarter of an inch deep. One thing I would encourage you to put in the mix of what you are discussing and ask you how you thought about it is how do we also really develop a much deeper understanding and connection for people not just on their individual actions, but their commitment to the larger kinds of actions that have got to happen, to their personal portfolios of what they hold as investments, et cetera, and maybe you could speak to some of that.

MR. PASCUAL: And let me take a question over here, please.

QUESTION: I wonder if all three speakers could provide some expanded dialogue on prospects for harmonizing greenhouse gas emissions

monitoring, auditing, and accounting schemes, particularly in view of the limited capabilities of developing nations perhaps to meet what is asked of them in that regard.

MR. PASCUAL: Let's start with the question on connection of individual action, and commitment, not just personal action, but in fact even the way people invest their finances. Reflections on that? Do you want to begin, David?

MR. SANDALOW: Sure. What Diane is reporting is encouraging and I think it is being experienced by anybody who spends time working on this issue, that the level of attention to this issue has just skyrocketed over the course of the past couple of years and I think there are a number of causes. One of them is just the pure underlying science, we have seen the Intergovernmental Panel on Climate Change, and it has just laid to rest a lot of the issues.

A second is the explosion of opportunities that particularly American companies have seen in the past couple of years, GE's Ecomagination campaign is one flagship, but there are lots of others. A third is what I think is a very interesting one, what is happening in the evangelical community in which there is a very vigorous discussion on this issue and leaders like Reverend Cizik and others have really been very outspoken about the very substantial portion of this country who attends evangelical churches paying attention to this issue is part of protecting God's creation. Central on the list it seems to me is "An Inconvenient Truth" and what Al Gore has been doing going around the country

educating people. I think it is also for people who were predisposed to think of this as an issue, it has raised the salience of the issue and said this is not just a climate problem, this is really a crisis we need to be paying attention to. So I think there are a lot of exciting developments.

I would say in terms of individual action, it is partly doing what you can to reduce your own emissions, and that is extremely important. It is also talking to friends and neighbors and being part of the political mobilization process because we of course are blessed to be in a democracy, and this is a challenging issue for a democracy. It is and it always will be inherently less vivid in some ways than some other problems so it requires discussion and engagement of neighbors, and it requires people talking to people they trust in order to mobilize them.

MR. PASCUAL: Yvo, I am going to ask you if you could pick up on the question, if I can make it a little bit broader, on developing countries and maybe address a developing country question from two perspectives. One is, how do you talk with the Chinas and Indias of the world and their particular issues related to economic growth and yet while at the same time becoming the largest emitters? Separately, the other developing country issue which is also a part of your constituency, countries like Mali and Bangladesh that are looking at flooding and desertification and how they come into the dialogue.

MR. DE BOER: I did not come here from Iowa, I came here from Illinois where I was at a trader's meeting in Chicago, people who make actually an

awful lot of money through carbon trading, and they talked about climate risk. After I had been in this meeting for about an hour, I found out that when they talk about climate risk, they do not mean risk that the climate is going to change, they mean risk that somebody is going to implement a policy, so a policy risk or a litigation risk, that is basically what they mean by climate risk. I think that those kinds of issues are really getting businesses to think in a very different way about what they are doing, what they are making, how they are spending their money, and how they are making it. So I sense that the business community is very much aware of how climate policy and climate change can impact on their image and I think that is useful. I personally do not believe that we have to destroy people's lifestyles and way of living in order to solve this problem which is probably a terrible thing to say.

On the developing country issue, what I found very interesting was recently to hear the Indian Minister of Finance say, I have a responsibility to grow my economy. I have a responsibility to eradicate poverty. But I am willing to act on the question of climate change to the extent that that is economically viable and I am willing to go even further if industrialized countries help me to do so. So I think this whole notion of international cooperation of working together with developing countries is absolutely essential, and I think the Clean Development Mechanism has shown, small as it may be, and I recognize it is small at $25 billion, it is showing that you can actually make money on greening the economic future of developing countries. So I think it is a concept that we need to expand.

The other interesting thing is you are not supposed to use the tax word so I will call it a levy, we put a levy on the Clean Development Mechanism of 2 percent and that is going to be generating somewhere around I think $50 million a year for adaptation money to go to help developing countries like Mali adapt to the consequences of climate change. Once again, that is a very small sum, but all of this is in the context of a 5 percent Kyoto emission reduction target. If we get Harlan's minus 50, then the $25 billion will be a lot more, the levy will be a lot more, and we will generating international resources to help developing countries reduce their emissions and adapt to the consequences.

MR. PASCUAL: Because we are short on time, in fact we have already gone past the time, what I am going to do is I am going to take two very quick questions and then give the panel an opportunity to comment on those questions or make any other final comments that they want, and I will start in the back over here first.

MR. MEYER: Alden Meyer with the Union of Concerned Scientists. It has been a fascinating panel. Thank you all for that. I wanted to come back to next week's major economies meeting, and I guess a question for Harlan. Given the discussion we have had about the magnitude of money that is needed both for technology investment in developing countries and the perhaps $50 billion or so a year needed for adaptation needs, if the administration continues to oppose global carbon markets, economy-wide targets, et cetera, is the President or Condi Rice going to be bringing alternative proposals to the table to

come up with that scale of resources over the next 40 years? The question for Yvo and David is, as we know, negotiators in other countries are already starting to look beyond this presidency to the next presidency and as David said, there is the likelihood of a dramatic change in U.S. domestic policy in 2009 and 2010. What are the incentives for the other major economies to try to reach a deal in the last year of this presidency rather than try to calibrate to the next president and where the Congress, the states, and business are going?

MR. PASCUAL: The final question here?

MR. ODERAMA: Fernando Oderama with the Emerging Markets Group. In the context of carbon markets, I understand that Clean Development Mechanism projects cannot divert ODA, official development assistance. But considering the likely impacts of global warming on developing economies, would it not make sense to diverge ODA through carbon financing, or better yet to leverage carbon financing through ODA?

MR. PASCUAL: Let me suggest this, that we proceed, if you don't mind, Harlan, since you have the microphone, we will start with you, and we can go to David, and then Yvo, we will give you the final word. We have questions on the table about global carbon markets, about the dynamics of negotiations, as well as investment in carbon mitigation including the use of ODA and what priority that should be. But let me also give you the flexibility, if there are other points that you feel like you need to put on the table before we go, to either ignore those or focus --

MR. WATSON: There was one question that the gentleman had which I do not think was addressed and was about the emissions monitoring and that is a real issue and we definitely need capacity building and we want to work with folks to do that. One the problems of course we have when we are talking about it, we do not even know what we have out there today that well. We have a fairly good idea from the good work of the IEA on what is happening with regard to fuel combustion, but the other gases, what is really happening in ag and so on, huge -- so we do not know really what 50 percent reduction means because we really do not have a really good baseline and it is very important that we develop that and it is going to take some education and cooperation with developing countries in particular.

With regard to Alden's question, first of all, I want to say we are not opposing cap and trade, if the E.U. wants to do this, Australia has announced it is going to do it, that is fine. We have not yet seen how it is going to work in the United States. And I also wanted to correct something earlier, David, I am sure that carbon markets are going to be part of the discussion and I did not put that up there, but obviously that is going to be discussed in the financing section and it is going to be discussed on what countries are doing, so certainly cap and trade and carbon markets are going to be part of the conversation next week.

With regard to what Secretary Rice and the President will be bringing to the table, I quite frankly do not know. I know there are a lot of ideas

working and that is all being decided above my pay grade, but stay tuned. I think you may hear some very interesting things next week.

MR. DE BOER: First of all, on the notion that you use official aid money to pay for the Clean Development Mechanism I do not think would go down terribly well. As was indicated in the introduction, climate change as we know it today was caused largely by industrialized countries so developing countries feel that industrialized countries should pay to clean up the mess. Official development assistance is intended to eradicate poverty. So if you take that money and do not spending it on eradicating poverty but spend it on climate change, then you are using poverty money to clean up the mess that industrialized countries caused which I do not think would be terribly popular.

In terms of when you do the deal, I remember very vividly that after Kyoto, President Clinton did not take the Kyoto Protocol to the Senate and he did not take it to the Senate because he knew there would not be support for it in the Senate. So quite honestly, I do not think the critical factor is who is the President of the United States, I think the critical factor is what is the general political consensus in the United States on the type of climate change policy that makes sense and I think we should take that into account very seriously whoever happens to be living in the White House, otherwise we will just be crafting another agreement which will not receive political support in this country.

Finally, to my mind, it is absolutely essential that we find the financial resources through capital markets, through the carbon market, through

government to government cooperation, to help major developing countries change their emission futures and limit the growth of their emissions. Given the fact that this problem was caused by industrialized countries, given that only very recently under the Climate Convention even those industrialized countries did not have legally binding emission reduction targets, so in a way the North is taking a phased approach to this and the South wants to take a phased approach to it as well but needs help to get there.

MR. PASCUAL: David?

MR. SANDALOW: Just to pick up in closing on two things that Yvo just said, one that I think I do not fully agree with which is the distinction between poverty and environmental protection in the context of ODA. This is a larger conversation, but it seems to me that the two are very inextricably linked in that obviously global warming is going to exacerbate poverty and vice versa -- you meant something much different than that, but I think these two go very closely together.

I think that Yvo just made a very fundamental point about the American political system which is worth highlighting. You are actually correct, that is, I said in my remarks that one of the things we all have to do is look back on the past and learn from the experience. One of the lessons I take from the Kyoto experience is that in the American political system, having the executive enter into an international agreement does not necessarily help to create a political consensus behind it. I think in the Kyoto process we saw almost the opposite, and

I think this is actually an important difference between European and American political culture. I think in Europe in general if one brings back an agreement, the public is more likely to rally behind it. So as we go forward over the next 5 or 10 years and beyond in negotiating these agreements, it will be very important for the American president whoever he or she may be to be negotiating agreements that have political support at home and that can be implemented at home.

MR. PASCUAL: David, and all of our panelists, thank you very much.

In the discussion today, some of the words that have come up over and over again are markets, technology, financing, and politics, and all of those are obviously going to be central to any kind of solution. The word uncertainty has come up a lot. There is increasing uncertainty about the impacts of what global warming would be, but a lot of uncertainty still about the technologies that will get us to the results that we want, and so that inevitably brings us back to what kinds of mechanisms will actually have the right kinds of impacts on those technologies.

We have talked a bit about universality, perhaps one of those things that we could have addressed more attention to, but in fact we are operating on an issue where, as David indicated, we have to start with national action, but if we do not put that back in in an international context and understand how it all comes back together, then we fail.

Then finally, in this kind of an environment, the kinds of signals that are given for the long-term are actually critical, signals about the targets, the kinds of targets, the goals that we are trying to achieve, the political signals as Yvo said, and inevitably I think price becomes a big factor in that as well because if you do not associate a price with it then it makes it difficult to understand how serious it is.

What we are going to start to see I think over the next week is a process of all of these factors coming together, whether it is in the global discussion that you are going to have at the U.N., whether it is in the discussion we are going to have in Washington, whether also in New York the kind of discussion that will emerge from the bottom up where businesses are going to be asking that question what is in fact that long-term signal, and this is really what we will need to see over the next 2 years if we are going to make that goal of having a negotiated agreement at the Conference of Parties that will take place at the end of 2009 of how all of these processes and ideas come together into a package that can be viable and achieve the kinds of long-term goals that we want in an environment that is still permeated by a great deal of uncertainty, and I think that is all part of what we are all going to be working toward.

I thank everybody very much for their participation and engagement, and I look forward to seeing many of you as we continue with the Brookings Energy Security Initiative. Thank you.

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