

**HEARING OF THE SENATE COMMITTEE ON FOREIGN
RELATIONS**

**SUBJECT: CHALLENGES AND OPPORTUNITIES FOR U.S.-
CHINA COOPERATION ON CLIMATE CHANGE**

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SEN. JOHN F. KERRY (D-MA): Thank you for joining us today.

Delegates from 192 nations are going to be spending the rest of this year doing the vital work of crafting a global climate change treaty to be negotiated in Copenhagen this December, but make no mistake. Those 190 plus nations are inevitably going to be taking their cues from just two nations. The reality is that a robust American partnership with China will do more than anything else to ensure a successful global response to the urgent threat of climate change.

America is the world's largest historical emitter of greenhouse gases that cause climate change, and China recently passed us to become the world's number one current emitter. So together, we are today responsible for nearly half of all global climate greenhouse gas emissions. Obviously, the full extent of our responsibility goes well beyond the numbers. Our words and our actions will set the tone, and Washington and Beijing have a unique opportunity here to be able to lead. Either we're going to create the necessary momentum right now -- June, July, August, September -- leading into Copenhagen, to galvanize a legitimate global response, or we truly risk a global catastrophe.

Last week, I visited China to assess where that country currently stands on climate change and what the realities of their position are. And it's interesting because I've been engaged with the Chinese on this topic for almost 20 years now, going back to Rio and the original Earth Summit in 1992. And really, it was a kind of one way discussion for about 15 of those 20 years, where you could sit with Chinese delegations, but there wasn't much feedback, there wasn't much engagement, there wasn't much discussion, and there, frankly, wasn't much happening on the positive side in China itself.

That has changed dramatically, I might say, over the course of the last years, and both in Bali as well as in Poznan, I met with Minister Ch'ien (sp), their lead negotiator on climate change, as I did meet with him last week in Beijing, and it is striking, the degree to which they are energized, enthusiastic, embracing new technology, setting goals and standards and moving aggressively in a new direction.

Last week, I met with top Chinese political leaders, energy executives, scientists, students and environmentalists. And what I heard was, in fact, very encouraging. Words are words. I understand that. And I'm meeting today with Todd Stern and John Holdren and others to discuss how we translate the words into specific actions.

But the fact is that the Chinese decision makers insisted to me repeatedly that China grasps the urgency of this problem. People who, a few short years ago, were not even willing to entertain this discussion are now unequivocal. China is eager to embrace low carbon development pathways and is ready to be, in their words, a positive, constructive force in Copenhagen, and in the negotiations going forward.

My message to the Chinese was very direct, simply that America understands that we have an obligation to lead as the historical largest emitter, but that China needs to understand, point blank, that if America went to zero tomorrow, China has the ability to obliterate every gain we make unless it is also a part of the solution, as well as other developing countries. And so the message is clear. America is no more likely to enter into a legally binding global solution in 2009 than it was back in the 1990s when we debated Kyoto, unless China is part of the solution and unless there is a global solution in the making through the Copenhagen process.

As the Chinese are beginning to realize, and I might add, that can be achieved by filling out the already adopted language of the U.N. process which refers to common but differentiated responsibilities, and most importantly, filling out the three words that came out of the Bali and Poznan process, that emissions reductions must be measureable, reportable, and verifiable. MRV, as it is referred to in the negotiating process.

The Chinese are beginning to realize that addressing climate change and pursuing sustainable energy policies is very much in their own national interest. China's ballooning growth has resulted in a resource dependency that comes with very real strategic costs. In a sense, China and the United States find themselves in very much similar kind of strategic box. Both of us have increasing economic demand, increasing power production demand, and both of us are predominantly dependent on foreign sources of fuel.

So, to the degree that we both move aggressively to create bio alternative renewable wind, solar, clean coal, et cetera, we are significantly advantaged because we both have significant supplies of coal and an ability to burn it, providing that it is clean. Of course, the costs of environmental devastation are also being felt in more than strategic terms for China. Air pollution causes the premature deaths of 750,000 Chinese people every year. Farmers are experiencing crop declining yields right now, and scientists are now warning that the Himalayan glaciers, which supply water to almost a billion people, could disappear completely by 2035.

Everyone I spoke to recognized these risks. So it's time to retire, once and for all, the old outdated stereotype and myth that China doesn't care at all, and China won't act. They do care and they are acting. They may not embrace exactly the same schedule immediately that we do, but I believe that if you give those concepts a verifiable, measurable, reportable, the life that they can be given, we are going to see very significant emissions reductions from China, and I'm willing to bet any of my colleagues in the United States Senate that if we don't get our act together significantly over the course of the next few years, we're going to be tracing China four or five years from now, because that's the rate that they are moving at.

I had the pleasure of riding on a 200 mile an hour bullet train from Beijing to Zhenjiang, steel on steel. Nancy Pelosi was there. We met one evening and chatted, and she had had the pleasure of riding on a 300 mile an hour maglev train from Shanghai, in from the airport to downtown.

Folks, those are cars that are off the road and people who move in a carbon low footprint, and we have yet to be able to get our Acela to be able to go more than 18 miles of the entire way to New York at 150 miles an hour.

So the challenge is pretty clear to me. The old train in Beijing took eight hours and it ran on diesel. The new one takes 29 minutes and in the next four years, China will extend its high speed rail system by 38 per cent. Earlier this year, while America spent \$80 billion (dollars) on green stimulus measures, the largest such investment in our history, China invested \$200 billion (dollars).

In the past few years, China has tripled its wind energy usage targets and quintupled its solar energy use targets for 2020. They set an energy intensity reduction target of 20 percent by 2020, and they are already moving ahead of that in certain sectors of their economy, and they've surprised themselves at the ease and rapidity with which they were able to do it. China has actually begun dynamiting, blowing up some of its small, dirty coal plants, because they're so inefficient, and replacing them with new technology and newer plants.

But as China builds and expands its industrial base, we obviously can't expect them to simply dynamite dirty sources of energy. We need to ensure that China starts building clean. Both countries have a great deal to gain from bilateral cooperation to develop and deploy clean energy sources. We have the chance to commercialize some of the most promising technologies, clean energy advances that can literally be transformational.

I raised these issues with Chinese Premier Li Keqiang and he was enthusiastic, literally saying, "Let's do it. Why don't you get the names of those businesses to our people, and we'll work together and see if we can start to joint venture and specifically describe how we could proceed forward." So the opportunity for Mr. Stern and the state department team is immense, and we should collaborate on multiple demonstration projects of near to market clean energy technology, from solar to thermal to carbon capture and storage.

We should combine forces in driving towards next generation battery and electric vehicle technology. I might add, China has already set a daunting goal, daunting both in respect to the challenge of doing it, but also with respect to us, because they are setting out to be the world's number one electric car manufacturer. At a time when we see the woes of Detroit, we ought to take a message from that and likewise get our act together. Most importantly, we need to inspire the 1.6 billion Americans and Chinese to take ownership of this challenge and prove to the world that we can rise up and meet it together.

Now, make no mistake. Bilateral cooperation with China is not an alternative to the global treaty process. On the contrary, it is an essential component of the larger effort. Our two countries, representing more than 50 percent of the emissions globally, have stood aside from this effort for too long, and now it falls to us to take the helm. And if we lead, if we prove our ability to be able to reach agreement on many of these issues in these next few weeks, that will have a profound impact on the negotiating positions and the capacity to move much more easily in Copenhagen.

We're very fortunate to have with us today a respected panel of experts. Ken Lieberthal served as senior director for Asia on the National Security Council under President Clinton and is a visiting fellow at the Brookings Institution. Elizabeth Economy is a senior fellow and director for Asia studies at the Council on Foreign Relations, and Bill Chandler is director of the Energy and Climate Program at the Carnegie Endowment for International Peace.

And let me just comment on one other thing we mark today also. Today is also the 20th anniversary, marking the violent crackdown against democracy advocates in Beijing's Tiananmen Square, and in dozens of other cities over China, and it would be inappropriate to simply gather here today and talk about the relationship with China without mentioning that, and remembering the sacrifice of those who lost their lives in pursuit of greater freedom. Obviously, much remains to be done in that regard, and as we continue to build a closer relationship with China, it's important for us to continue to urge the Chinese to unleash the dynamism of the Chinese people through further political liberalization and strengthening the rule of law and making government fully accountable to the people.

And I think that China's success in that endeavor is also of profound interest to our relationship and to the United States. My visit last week confirmed for me China's indispensable role in tackling a host of international problems, from the global financial crisis to the subject of today's hearing, and I look forward to growing this relationship that is perhaps the most important bilateral relationship on the planet today, and there's much that we need to do with respect to nuclear proliferation, with North Korea, as well as the other issues I've mentioned.

Senator Lugar.

SEN. RICHARD G. LUGAR (R-IN): Well, thank you very much, Mr. Chairman. I congratulate you on your trip to China, your diplomacy, and likewise your survival at 200 miles an hour (laughter), in addition to the Speaker of the House's feat.

Let me just say I join you also in welcoming our distinguished panel, and we look forward to hearing you and discussing the subject with you.

As the chairman has pointed out, China's actions are critical to the success of any global efforts to millions of reduced carbon emissions. Not only is China the largest source of greenhouse gases, its negotiating positions are influential on the G-77 developing nations and others. Chinese responses to climate change and to global negotiations on the subject have already been complex and sometimes contradictory.

The words and actions of Chinese leaders indicate that they see climate change as a risk to the stability and development of their country. Yet this focus on stability also reduces China's willingness to limit carbon usage in ways that might impede economic growth. China has demonstrated a strong appetite for developing and deploying cleaner energy technologies, including solar and wind energy systems. Yet it continues to build coal fired power plants at a rapid rate.

It has issued forward-looking regulations and mileage standards designed to produce a greener economy. Yet it remains unclear whether China will develop the capacity to effectively implement its new regulations or even whether it can accurately measure their impact. China has productively discussed some climate change issues in bilateral negotiations. Yet in association with the G-77, it routinely engages in strident rhetoric that blames the West for climate change and supports counterproductive policy demands, such as having consumers in the West pay for the carbon content of products they buy from China.

China's position on climate change is more than a diplomatic problem for the United States. The American domestic debate on this issue will be profoundly influenced by perceptions of China's willingness to set aside doctrinaire positions and to agree on steps to limit greenhouse gas emissions. China's status as a non-democratic nation, which lacks the checks and balances provided by a free press and other democratic institutions, will complicate the verification of any climate change agreement.

Moreover, the fundamental trends in China toward industrialization, urbanization, and higher standards of living will have far more impact on the growth of emissions than government policy. Now, a starting point for our discussion is what can realistically be achieved through bilateral talks with the Chinese government. In my judgment, there is no doubt that such talks should be pursued, probably in a format that can include not just energy and climate, but also economic, security, and other issues.

Even apart from climate change concerns, our nation has a strong interest in improving our communications with Beijing and making progress on common interests. I appreciate the diplomatic efforts already undertaken by the Obama Administration and especially the

efforts of our chairman, John Kerry. As I have mentioned in past hearings, it is critical that the American people have a much clearer picture of the overall elements of the climate change problem and the Administration's strategy in structuring a potential agreement.

American participation in any global climate agreement is likely to bring profound changes to the American economy and culture that require the achievement of much greater consensus than we now have. Absent a reasonable consensus on how we structure our response, and what sacrifices we have to make, implementations of a climate change policy is far more likely to be ineffective, economically damaging, and divisive, if we do not have a common consensus. Part of this understanding involves how American efforts on climate change fit into global efforts.

The overall volume of greenhouse gases released by China, India, and other rapidly developing countries is expected to continue to grow under almost any scenario. If this is the case, the American people will require much greater confidence that mitigation steps taken by the United States and other developed nations, combined with commitments by China and other developing nations to slow the growth of their greenhouse gases, will finally produce a meaningful result. I thank the Chairman again for calling the hearing, and we look forward to the insights of our witnesses.

SEN. KERRY: Thank you very much, Senator Lugar, and thank you for your personal comments, and I appreciate the questions you've raised, and, needless to say, they've got to be answered as we go forward.

Mr. Lieberthal, if you would lead off, and then Elizabeth and then we'll just go down the line. Thanks.

MR. LIEBERTHAL: Thank you, Mr. Chairman and Senator Lugar.

I appreciate the opportunity to comment on the critical issue of challenges and opportunities for U.S.-China cooperation on climate change. China's rate of growth of carbon emissions, especially since 2002, has been extremely steep, and pollution problems in China, I think, are rightly viewed as severe. Most Americans seem to believe that China is therefore ignoring its carbon emissions while pursuing all-out economic growth.

But, as you just explained, Mr. Chairman, the reality is that the leaders in Beijing have adopted serious measures to bring growth in carbon emissions under control, even as they have tried to maintain rapid overall expansion of GDP. To engage effectively with the Chinese and achieve the best outcomes on carbon emissions with them, it is important to have a realistic understanding, both of the reasons their emissions are growing so rapidly, and of the types of efforts they are making. It is critical for the U.S. and China to find ways to work as effectively as possible to reduce overall greenhouse gas emissions, and this requires reality-based approaches by each side toward the other.

Why are China's greenhouse gas emissions increasing so rapidly? Fundamental to the answer is that, first, China's economy is based overwhelmingly on coal, and second, China retains many of the problems of a developing country. Coal currently provides about 70 percent of

China's energy, and there is no serious alternative to coal for many years to come. Without development and deployment of technology to reduce coal's carbon footprint, the future looks grim for China's carbon emissions, and this, I believe, provides a major area for potential U.S.-China cooperation.

China describes itself as a developing country, and it is more than half right. It makes sense to envision China as a group of relatively developed islands with a cumulative population of over 400 million people that are scattered around in a sea of over 800 million people who live very much in developing country conditions. The interaction between the developed areas and the developing regions is pervasive and it affects every dimension of economic, social, and political life in China. Every Chinese leader views the developing part of the country as a constant and pressing reality.

One of the results of this developing country context is that China encounters more fundamental problems regarding human capital, infrastructure, social malaise, and technical capabilities than most of us appreciate. Put simply, China's leaders lack the institutional and technical capabilities to achieve many of the improved energy outcomes that they seek. Indeed, the issue of capacity building is critically important for China's future outcomes in the clean energy and climate change arenas, and provides a major area of potential U.S.-China cooperation.

Another reality of China's developing country context is that Beijing is also focused on managing perhaps the greatest migratory flow in human history as urbanization proceeds on an almost unimaginable scale. Since 1992, nearly 200 million Chinese have shifted from rural to urban life, and the current pace of migration of about 15 million people per year moving into the cities is likely to continue for another 15 to 20 years. The resulting requirements for new power generation, building construction, transportation, education, health services and so forth, means that, effectively, China has to build urban infrastructure and create urban jobs for a new, relatively poor city of 1.25 million people every month, and that will likely continue for the better part of the next two decades.

The key industries that support the related infrastructure development -- cement, steel, petrochemicals, power, and aluminum -- have been among the fastest growing industries in China over the past half decade, and are also the most important sources of greenhouse gas emissions. In addition, as more Chinese achieve higher incomes, they want comfortable transportation, including private cars. Many are also upgrading their homes, making them larger and filling them with appliances. Carbon emissions growth reflects, therefore, extremely fundamental forces in China's development.

China's leaders also have competing environmental concerns, especially focused on water distribution and quality and on extremely severe air pollution, and those divert serious resources from attacking the issue of carbon emissions. In sum, while visits to Beijing or other major coastal cities may create the impression that China is a relatively developed country, the reality is far different. The underdeveloped parts of China have a population nearly three times the size of our own population, and that population's needs and capabilities inevitably shape major outcomes in China.

None of the above should be interpreted as indicating that controlling greenhouse gas emissions is not on Beijing's priority list. That would be very far from the truth, as China sees itself as one of the countries most vulnerable to damage from climate change. In fact, when you look at the policies and programs already in place, they are very impressive, and they are constantly growing. Even the following short list of key official targets, every one of them backed up by substantial commitments of resources, suggests the reality that China is taking these issues very seriously.

The targets include seeking a 20 percent reduction in energy intensity for all GDP during the 11th five-year plan, from 2006 to 2010. According to Chinese authorities, meeting this target will reduce total carbon emissions by roughly one billion tons of CO₂ over the course of the plan as against a "business as usual" (BAU) model. Adopting the target of having renewable fuels account for 10 percent of China's total energy consumption by 2010 and 15 percent by 2020. As part of this, there are major programs and mandates in solar, wind, nuclear and hydro, and there is much work being done on bio fuels.

Taking serious measures to reduce the emissions from coal fired power generation facilities, including shutting down small scale plants, and deploying on a large scale the most advanced technologies on all new coal fired plants. Investing over \$88 billion in ultra high voltage transmissions smart grid projects by 2020. And the final target includes various additional measures in electric vehicles, mass transit, electrified trains for freight hauling and so forth.

The bottom line is that China faces enormous pressures via urbanization and other aspects of development to continue massive creation of infrastructure. It takes reduction of greenhouse gas emissions as against a business as usual model extremely seriously, and it has more problems in terms of lack of capacity than is true for developed countries. There are serious implications for the U.S. and China, and for Copenhagen in the above remarks. These include, first, U.S.-China cooperation on clean energy can be in both of our interests. We have many complementary capabilities. But such cooperation has to be based on the trust that grows out of realistic understandings of each other's actions, problems, worries, capabilities, and goals. That trust, I believe, is not yet there.

Second, at Copenhagen, China should be pushed hard to accept targets for greenhouse gas emissions that require major efforts for them to achieve, with full verification requirements. But China will, in my judgment, not accept caps at this point, as it does not see how it can actually cap emissions growth, in the face of ongoing urbanization and other demands. Beijing does not accept international obligations that it does not think it is capable of meeting.

And finally, the United States and China should work to develop a major clean energy partnership. Achieving such a partnership will provide new momentum for the Copenhagen effort. I hope these comments are helpful, and I look forward to your questions. Thank you, sir.

SEN. KERRY: They are indeed very helpful.

Thank you.

Ms. Economy.

MS. ECONOMY: Thank you very much, Mr. Chairman and Senator Lugar.

It is a pleasure to be here to have the opportunity to discuss how the United States and China can best work together to address the challenge of global climate change. Within this very broad mandate, I was asked to talk about two specific issues this morning. First, how can the United States help support measuring, reporting and verification in China, and second, what might be some of the priorities for a clean energy partnership between our two countries?

In terms of MRV, these are, of course, the very building blocks of an effective domestic climate program for China as well as China's commitment to a robust international regime. China is still at a very nascent stage of capacity in these areas. The central government, for example, has called for the provinces to develop their own climate action plans, but many of these provinces have very little idea about how to proceed, other than to copy blindly what Beijing has already issued. I think this offers some real opportunities for cooperation.

First, we can begin by helping the provinces to develop inventories of their greenhouse gas emissions. We can assist China with both the technology and the methodology from everything from ground sampling for methane emissions for rice production, to advanced stage continuous emissions monitoring. It's not going to be easy. Beijing has many strictures on information transmission, not only to its foreign partners, but also within the government, but I think this is an essential first step for any real commitment that China might be willing to sign onto.

Second, I think we have the opportunity to work with Chinese companies to begin to develop a registry of their greenhouse gas emissions and mitigation measures. I think this is an important resource for China and for Chinese companies as the country moves toward a time when it will have to assume a cap on its emissions and perhaps it will adopt a cap and trade system. Some Chinese companies, mostly those with ambitions to be global leaders are already moving in this direction.

I sit on a board of a Chinese group that scorecards multinational and Chinese companies on their sustainability initiatives. Two years ago, we only had multinationals to scorecard. This year, we had two dozen Chinese companies that wanted to be evaluated, and of those I would say five or six actually had greenhouse gas mitigation measures listed as part of their sustainability initiatives. Their initiatives were not systematic or systematic or comprehensive in anyway. And certainly the number of companies in China that are undertaking -- that is undertaking these kinds of efforts is still small.

But I do think here in the United States we have extensive experience with this, and we can begin to share this expertise on a company-to-company basis. And I think, again, it's very important as China moves forward toward a true commitment in a, in a cap emission system.

And third, in some ways, most difficult is clearly verification. There are few incentives within China's political system to enforce environment-related laws and regulations.

Even when Chinese factories and power plants have pollution control equipment, they often don't use it or they may use it only when the inspectors appear. There's very poor data collection, transmission, and transparency at every level of the Chinese system, and the incentive is often to hide negative information.

And we saw this in the run-up to the Olympics when the Beijing City government simply moved the air pollution monitoring equipment from one part of the city to another in order to put forth a better air quality statistics than were actually there.

So I think that this effort to help China develop a more transparent accountable and rule-based system would be a long process, but an absolute critical one. And California here is beginning an initiative, I think that is going to try to address some of this problem. It has a climate governance partnership that it's trying to establish with a number of providences where they're going to bring together members of different parts of the bureaucracy at the local level to try the forms of climate action task forces, and to encourage information-sharing and transparency and accountability at the local level. Again, this is going to be a very long process, but an absolutely essential one.

The second area I was asked to discuss was what the priorities might be for a Clean Energy Partnership between the United States and China. I think -- as I think Ken was indicating, the partnership needs to look ahead over the next 10 to 20 years at the profound changes, both within China and in terms of China's rule abroad, and structure the partnership in that context.

So within China, I think this means working closely with the Chinese, as they are transforming their country from a rural to an urban-based society. Ken mentioned they plan to urbanize 400 million people between 2000 and 2030. Significantly, urban residents use three and a half times more energy than their rural counterparts.

But this is our future. I think we need to be looking at partnerships that focus on, you know, alternative-energy vehicles. And we already have eco-partnership on this issue, under the strategic economic dialogue between China Motors and Ford Motor Company. And the cities of Denver and Chongqing. We should be looking aggressively at what is taking place with that initiative. Seeing what are the obstacles. What are the opportunities. Is this something that can be replicated, you know, throughout other parts of China. If it is not working, how do we revise it.

Another priority in our -- both our countries would be capacity building for the development enforcement of energy-efficient building codes, as well as the deployment of new building materials. Half of all new building space in the world is going up in China. We are missing an enormous opportunity right now. And China right now is at about a 5 percent compliance rate with their own energy building efficiency codes.

Ken also mentioned energy-efficient appliances. It sounds like a small thing -- (laughs) -- but if you think about 800 million more people, you think air conditioners and dishwashers and refrigerators and televisions, you begin to get the picture that this is going to be quite a significant source of new energy use within the country.

And I spoke with a major retailer in China a couple of days ago, who told me that energy-efficient appliances make up only one percent of their appliance sales in China. So there's a lot of work to be done in terms of promoting, you know, an Energy Star Rating System within China, and education of the Chinese consumer.

Last on this point, there's a lot of discussion about technology transfer, Joint R&D, making clean coil technologies in China commercially viable, because they're all very important aspects. And I think there are a lot of already very interesting partnerships emerging.

Before I came to provide this testimony, I spoke with a friend of mine, Patrick (Jennivine ?), who has a wind power company based in Texas, and does as a joint venture in China. They make wind power -- the blades for a wind power. And he just received \$300 million in financing from the parent company of his Chinese joint venture partner to develop wind farms here in the United States.

So when you -- and 40 percent of the components will be made here, 60 percent of the components will be made in China. And this is the kind of partnership and development that I think we want to see happen. And how to do that on a larger scale, I think is something we need to think through.

I'll just mention the -- I think it's important to remember that technology doesn't matter, unless the political and economic system is there to support it. And when I speak with U.S. companies, and I'm sure that is true for all of -- (laughs) -- you, but they talk about, in their dealings with China, is contract-sanity enforcement and certainty of regulation. And that all takes us back to governance and capacity building.

Finally, I mentioned that the partnership ought to address the profound changes in China's role abroad. China's drive for -- and I don't think this is something very many people have been thinking about.

China's drive for resources, timber commodities, you know, food crops, oil and gas has brought tens of thousands of Chinese companies to Africa, Latin America, Southeast Asia, along with millions of Chinese workers, with very little to no environmental supervision.

China is now the largest importer of timber in the world, and the largest importer of illegal logged timber in the world. It is contributing to rapid deforestation in places as far off Cambodia -- (inaudible) -- Russia, Indonesia. So even as China is undertaking positive climate mitigation efforts with its afforestation program, within its own borders. It is contributing to the opposite -- (laughs) -- in many countries abroad.

So I think that as we think through, again, a climate partnership with China, it ought to be in the context of a kind of global sustainability program that would encourage China, the U.S. and third countries to discuss the actions of Chinese multinationals abroad.

SEN. KERRY: When you say it's contributing to the opposite, is that just by virtue of demand?

MS. ECONOMY: It's contributing by chopping down all the forest.

SEN. KERRY: Right.

MS. ECONOMY: All the old-growth forest. And there are many areas, I think in which, you know, the U.S. and China can cooperate on global climate change. And from my perspective, I think as my remarks have indicated and thus important, is building capacity and transparency, official accountability in the rule of law.

I think these are the essential elements of the Chinese system that is going to be able to deliver, not only on its promises for global climate change, but also on issues like intellectual property rights or as Senator Kerry, I think mentioned, and I think it's important to remember today and to do forth, for the protection of individual rights and freedoms.

Thank you.

SEN. KERRY: Thank you very much, Ms. Economy.

Mr. Chandler.

MR. CHANDLER: Thank you, Mr. Chairman, Senator Lugar. I very much appreciate being included in this important session. I'm happy to say that I agree with everything you both said in your opening statements.

And, Senator Kerry, I agree with you that as your visit demonstrated last week, we have now a historic opportunity to make a climate deal with China that will make a big difference. So if we succeed, we can protect the global environment. If we fail, we will suffer grave damage to our coastal cities, our energy food and water supplies and the majesty of our parks and wild lands. If we succeed, we'll also create American jobs and American businesses.

Why do you we have this historic opportunity now, three important reasons. Newly energized leadership in the United States, but second, it is clear that China recognizes the importance, as you said, of responding to the, to the threat of climate change. And third, because of efforts on both sides to discuss the important elements of how we can cooperate, I think we are beginning to make some progress.

Over the past couple of years, American and Chinese experts, with the support of this committee I'm happy to say, and I want to thank you for the staff time and the, the support the committee has provided to these track two discussions. They have helped get pass what Senator Lugar described as an important problem of the public presentation of China's position versus what is said in private.

So in moving beyond the camera lights and trying to get out of the glare of the, the lights, we hoped we could arrive at a consensus of the kinds of things that would make a difference. The Chinese delegation reciprocated with our expressions of interests with enthusiasm and placed Minister Chen Deming at the head of these, these discussions. And he has -- China's chief global climate negotiator made an important contribution.

The three areas on which we felt we came with consensus in which we should begin our cooperation, included the following things: First, rapid deployment of energy-efficiency technologies to achieve quick wins in reducing greenhouse gas emissions. And in that area, building capacity -- human capacity, particularly at the provincial level, as Liz said, is a top priority.

Second, joint research and development, both on low carbon automobiles, transportation, and coal-fire power plants, a mechanism something like what we did in Russia at the end of the Cold War with the Civilian Research and Development Foundation, where we have joint funding, with both U.S. and Chinese support. It might be a good mechanism to pursue those kinds of R&D approaches.

And third, collaboration, again, on -- to the extent that we can in frank and honest discussions to reach a global deal, in which both the United States and China can participate.

I think they -- the Chinese side clearly wants to work with the United States in these areas, and if they do, we can implement scenarios such as those produced by the Energy Research Institute, which is the leading dictate in China. It is part of the National Development and Reform Commission, in which they suggest that what China can do, on a different schedule from ourselves, but on an important and compressed schedule, reducing growth and emissions over the next decade or so to half the rate of growth of the economy. And then from that level, making an absolute reduction in emissions by the middle of the century.

If we can get on such a trajectory, we have a serious chance of achieving an atmospheric concentration below 500 parts per million, which many of us think is really crucial.

Cooperation in science and technology is going to be vital for China, but it's not enough. China needs the benefit of our experience in using market mechanisms to achieve environmental goals, and we would urge this committee and the Chinese government to consider the following policy changes that might make a big difference.

Number one, encouraging investment in more efficient industry and buildings. Two, providing tax holidays and easing foreign exchange and foreign investment restrictions on clean energy companies and services. And three, making it easier for banks and the financial system in China to risk-based lending for clean energy products.

These are things we sometimes take for granted, but they don't work very well. And they contribute to barriers that frustrate American clean energy companies trying to do business in China.

Our own top priority should be, again in an asymmetric way, but an important thing to show that China is -- to China that we are serious is to enact cap and trade legislation to control our own greenhouse gases. And the draft legislation in the House of Representatives has already made a strong impression on China that we are serious.

And Ken and Liz both said, I think we should -- I agree we should recognize the strenuous efforts China has already made. It frustrates the Chinese that they -- that many people

outside the country don't get how hard it has been for them to take serious efforts to close down, not just power plants, but many old inefficient industries. I see it. I got to China once a month, and I see it every time I go. There are many new factories closed down and new standards imposed on the new modern systems.

So we can ask China to take further action, not necessarily to capture emissions in the short-term, but to set ambitious submissions targets with verifiable and enforceable measures to achieve them.

The Chinese are practical. If we make it in their interest to work with us, they will do so. Just to reiterate, I think it's important that first, we show leadership. And if we do, then the redirect of the G77 countries that it is all our fault and all our responsibility, loses its power.

The Chinese government accepts the science and threat of climate change, and I believe they will work with us.

Thank you.

SEN. KERRY: Thank you. And thank you, all three of you.

Let me try to establish here sort of a baseline, if you will. One of the things that I run into a lot, and it's understandable, is people sort of just really react and say, "Well, what do you mean China is a developing country," and they sort of -- they, they assert that notion, because most people obviously don't see the 800 million people who are living on 2000 air or less, who are yet to come into the urban society.

They see only the Beijing, the Shanghai, Guangzhou, and so forth, that are these unbelievably energized teaming manufacturing centers, and they see made in China on all the products coming in here. There's an automatic sense, you know, well, they are not -- they may not be full developed, but they are not like other developing countries, either.

So what do we do here, create a different category? Try to reach an understanding that, indeed, they are not yet a fully developed industrialized company, but on the other hand, nor are they the undeveloped country that we contemplated when we did Annex 1 and Treaty back in the Kyoto. It's something new and different now, and they need to understand that. Is that fair?

MR. CHANDLER: I think that's fair. I think the thing that Chinese leaders wake up worrying about at night is instability in their own country. And that is generated as much as anything by disparities and income, so providing China with a way to achieve its economic ambitions and to grow, while at the same time separately achieving emissions reduction goals through identifiable and enforceable measures is going to be key. A different schedule, a different approach of measures and policies, but enforceable ones.

SEN. KERRY: Well, I understand that, but the key is also for China, nobody -- I mean, one of the things that I emphasize every time I get into that discussion, and we've done this for a long time now, is no one here -- for years, I think the Chinese believed the United States was

engaged in -- this whole notion of tying them to a standard was an effort to try to restrain growth in China.

And I think it is finally daunting on people that no, we don't want -- you know, we're not out to restrain growth. We want China to grow. We would all be better off if China will grow. We want it to grow clean, just as we need to grow clean. I mean, what we're talking about here is the transformation to sustainable economy. And so when you talk about the building codes, Ms. Economy, buildings are about 37 percent of the greenhouse gas emissions. I mean, everywhere. Our buildings, everybody's buildings.

And so in order to reduce greenhouse gas emission, you don't just look at the transportation sector or the manufacturing sector, you have to look at buildings, also. And the question is: How do you get them in this process in these next days to buy in more to this -- to bending over backwards to embrace the new components, new materials, new building materials, new building codes, new standards by which you can dramatically reduce emissions, and, in fact, make it pay for itself.

This is not out-of-pocket money. It pays for itself to do these things. How do we achieve that?

MR. CHANDLER: Well, it's not very hard to convince them that it's in their best interest to make, to make those changes. I do think they need assistance with capacity building at the provincial level in writing the kinds of codes and incentive policies that private sector -- the private sector needs to put those technologies into place.

I think there's a disconnect between the provincial level and the, the central government, which -- the central government makes orders and asks the provincial level to achieve the, the goals, to meet those targets. Provincial leaders don't have the tools to achieve those goals, the, the ones that they need. They don't have authority over changing taxes. They can't implement standards on their own organizing finance for, for the private sector to make investments.

Working with the central government to help them close that gap with the provincial leaders, who are under the gun to make improvements, will help the provincial leaders achieve their own goals.

SEN. KERRY: Yes, Mr. Lugar -- Ken.

MR. LIEBERTHAL: If I can add a couple of comments to that. One, I think that it is obviously important to get the provincial leaders more positively engaged in this. But I think -- you know, you have to keep in mind China has center providence and then city, county and township. Each of those levels is important.

And for purposes of building codes, I think actually the most critical level is the municipal level. There are over 650 municipalities in China, and they do a lot of that -- a lot of the building takes place within that, within that jurisdiction. One of the biggest problems at municipal level is simply lack of human capital.

To understand, for example, energy audits, China has 220 local energy centers around the country. They have almost no one at any of those centers who knows how to do an energy audit. That's a wonderful area for us to get engaged and train some of the auditors in what we know about doing energy audits. It can have an enormous impact.

So a lot of this is they have the codes. Sometimes the incentives are wrong, I very much agree with Bill on that. But beyond that, they just simply lack the technical human capability at the critical nodes in their system. And that's where I think we can come in, in a very positive and not very expensive fashion to work with them to try to realize some of these gains, and give them -- to help them to acquire the tools to do so.

The last thing I would comment is, going back to your original question, I think it is very important for us to get out of this kind of categorization of, you know, treating the developing countries as a block. And when it comes to carbon emissions, they are anything but. And we need to individualize that much more.

There's a -- one of the proposals in China is to think in terms of the Human Development Index, and what percentage of the population in each of the major companies is at what level on the Human, Human Development Index. And therefore, how should you sculpt policy or sculpt obligations country by country.

I say that simply to say there is creative thinking going on, on this, and we ought to try to join that and encourage it.

SEN. KERRY: So what would you make -- as this team goes over there to negotiate next week, what would you want to see them achieve? I mean, what are the priorities that you would lay out in terms of that negotiating process?

MR. LIEBERTHAL: Sir, I would, I would answer that on two levels. First, we have a kind of two track negotiation going on with the Chinese. One is to develop a U.S./China Clean Energy Partnership. This would be a bilateral agreement. The other is to try to get a more forward looking stance at Copenhagen. And if we can do the Clean Energy Partnership, I think that will add a lot of momentum going into Copenhagen.

But those are two different negotiating context. When you raise Copenhagen with the Chinese, the foreign ministry gets deeply engages, and G77 and related considerations move to a prominent position on the agenda. So my feeling is first of all, I would encourage our team to keep those two tracks distinct. Because I think we can make much more rapid progress and effective progress in the coming months, if we focus on the Clean Energy Partnership.

And then hopefully when the president goes to China toward the end of this year, before Copenhagen, we'll be able to announce the Clean Energy Partnership and, and have the two presidents address Copenhagen in that context. And I think that's simply the more effective negotiating track.

Secondly, on substance, I think the Chinese really are now looking for, let's do a partnership, but let's not just make it redder. We had -- we have had 42 energy -- bilateral energy agreements with the United States in the past. None of them has met the goals of the agreement.

So they are asking for, "What will you concretely be interested in committing to?" And to my mind, the three big areas -- there are obviously more priorities that warrant attention, but the three big areas are coal -- carbon capture sequestration for coal-powered generation, electric vehicles, and building energy efficiency.

And I think if you can, if you can do something serious in each of those three areas, you are going to make a significant dent in the problem. And they are interested in all three.

MR. CHANDLER: Mr. Chairman, can I jump in and underline what he just said?

SEN. KERRY: Yes.

MR. CHANDLER: In the past, in the '90s, I sat across the table from Chinese -- our counterparts trying to implement many of these memorandums of understanding. Too often, they end up just being talking, talking, talking. If you try to do too many different things without enough resources, then everyone gets frustrated. And that is why I think it is important to focus on the things that, that really matter, and take them seriously. Focus on those things that the U.S. and China have to do together if we are going to solve those problems.

SEN. KERRY: Well, the key to solving this under any circumstance, and particularly to getting Copenhagen to come together, is going to be the MRV, measurable, reportable, verifiable. And, Ms. Economy, you have talked about the difficulty of getting some of the accountability that you need here and the capacity for that. So it would seem to me that one of the urgent needs here that ought to be discussed over the course of the next days is how we are going to work on that together, so we don't wind up in November or September, sitting there saying, "Well, gee, that sounds nice, but we're just not able to do it," or we're sitting there saying, "Thanks for saying that, but we have no way of measuring what you have just said you are going to do."

We have got to set up a structure here now to build the capacity and have confidence that we can come in with something that is truly measurable, verifiable. And how do we do that?

MS. ECONOMY: As I mentioned, I think California is taking the lead, at least in looking at this issue. And I think they see this is a long-term process, so I would imagine that the best you are going to be able to offer within a month or two or three months is going to be the framework of agreement for moving forward on MRV.

Beijing has certain providences in mind where they want to have test cases. These may not be the most progressive places, which means it is likely that we could be knocking our heads against a closed door, rather than an open door. Now, it is very different providence to providence and municipality to municipality.

I think -- one of, one of the suggestions that I often make is that when we look to cooperate with China, and I think this would be true with MRV, as well, is that we look to the national model environmental cities. And these are cities that have already -- where they have local leadership that is already committed to doing much more, frankly, than the vast majority of cities in the country to meeting their own domestic environmental laws and regulations.

So there are about 10 percent of China's 660 odd cities that meet these national model environmental targets. And I would suggest that we go to those cities and begin with this process of MRV. And I think that is where we will have an open door or a relatively more open door, because they are, they are already transparent. They are already looking to turn the corner in terms of their own environment.

So that, that would be my primary suggestion for how we would move forward.

SEN. KERRY: Senator Lugar.

SEN. LUGAR: Well, thank you, Mr. Chairman. Mr. Chandler, you mentioned the 500 parts per million sort of limit in which many scientists feel that if the world comes to that, with regard to CO₂, there are, there are catastrophic results.

The question that I asked this morning is one of how you, as thought leaders, and we, in the political round, can try to bring some case to the American people of what the catastrophe is or even how the catastrophe is progressing. And the reason I say this is that in the intelligence in the scientific community and the think tanks, there is a given that we are progressing towards catastrophic results.

Therefore, as you inform us today, there is no doubt in your minds that action plans are required, and they are very difficult. And we are discussing a very large part of that problem, the Chinese/American relations. But now very specifically here in this country, we have a debate going on. The cap and trade legislation that you have mentioned is now being discussed by the House of Representatives in this various committees.

Some of you may have noted, as I did, an editorial in Monday's Washington Post by economist, Martin Feldstein, who cited the Congressional Budget Office analysis that reducing U.S. carbon dioxide emissions by 15 percent would cost the typical American household \$1,600.00 a year, immediately and proceeding. And Americans should ask whether this tax of \$1,600.00-plus per family is justified by the very small resulting decline in global CO₂. Since the CO₂ production, he says, is now less than 25 percent, and it is projected to decline as China and other developing nations grow.

A 15 percent decline in U.S. CO₂ would lower global CO₂ allocate by less than 4 percent. And the impact on global warming, therefore, he says is unnoticeable. Now, he reflects skepticism, not just among certain economists, but I would say perhaps even a majority of my constituents. And they see the \$1,600.00 coming along, and they see us discussing theoretically how the United States and China and others might meet in Copenhagen.

But the case has not been made demonstrably by the American people, as to what the problem is. Why this is worth \$1,600.00 a year or more as the case may be as we progress.

Just discuss broadly what kind of a public education situation is conceivable in this particular timeframe or, really for that matter, for the next two years. So that there is, in fact, a general feeling in the country that action should be taken, and the debate then comes down to the specific measures of meeting something that is really seemed to be by a majority of perceived need.

Does anybody have a thought? Yes? Dr. Lieberthal?

DR. LIEBERTHAL: Thank you for raising that question, Senator. We've discussed it before, and it is crucially important.

I think that, first of all, we have to communicate to the American public that they are already paying a high price for carbon emissions. Whether it is the reality that California now has a fire season that extends 12 months a year or the reality that we have lost hundreds of square miles of forests in the Northwest or the reality of increasing storms and their damage in the Gulf Coast or the reality of prolonged drought in the Southeast, you name it, we are already paying a high price.

The problem is that the price is not structured in a way that there's any incentive to reduce carbon emissions, and so part of what we have to communicate to the American people is not this kind of broad -- you know, polar bears are going to have a tougher time and, you know, in a hundred years from now, we may be in trouble. It's got to be articulated in part in terms of current pocketbook issues with some reasonable numbers attached.

Secondly, I believe very strongly that the president personally has to lead the charge on this and that the rhetoric again is not going to resonate if it focuses on Copenhagen and our global obligations and that kind of thing. We have a president who has extraordinary communications capabilities. He's got to do better than Al Gore did a few years ago in bringing home the reality of what we are confronting, the risk to the next generation, and the cost to our current generation.

And, thirdly, in terms of our reductions only being a very small part of global reductions, the reality is if America is going to have a leadership position in the world, this is one of the most important issues the world faces going forward, and if we don't lead here, we aren't going to lead very effectively anywhere else either.

So I think those themes have to be articulated in a vivid fashion, led by the president, backed up by the Cabinet, hopefully with support of articulate members of this body, in order to get the message across to the American people and change the politics of the issue.

SEN. LUGAR: Ms. Economy?

MS. ECONOMY: (Off mike.) Oh, sorry. I agree with everything that Ken just mentioned, and I guess I think there's a second part to that, which is the idea that climate change in

essence is also an opportunity, right, and I think that President Obama began very early on even before he took office to talk about green energy and sort of clean energy future for our country, and I think this has to be an integral part of how we put forth a message on climate change to the American people. It is what will get them excited about moving forward on this issue.

And so I think that in addition to the sort of "watch out" message, which is very, very real, there should be an opportunity sort of presented to the American people to move our country forward into the 21st century and to take a leading economic role so that, as Senator Kerry mentioned, we're not chasing the Chinese five or 10 years from now on electric cars and a vast array of other renewable and efficient technologies.

SEN. LUGAR: Mr. Chandler?

MR. CHANDLER: I want to thank you for giving me the opportunity to correct any impression that I may have given that 500 is okay because I'm more and more coming to agree with Jim Hansen that 500 may be even too much.

SEN. LUGAR: Now where are we now?

MR. CHANDLER: Oh, 380. I forget the latest number, but increasing a couple of ticks per year. So --

SEN. LUGAR: What do you think then -- reduce 500 to what?

MR. CHANDLER: Well, I've always been an advocate for 450, but Jim Hansen tells me that's not ambitious enough. So the point about 500 is if you go beyond that, because of acidification of the oceans, you lose the barrier reefs, you lose the protein source for tens of millions of people, the exclusive protein source, a third of the world's fishes. It's clearly a threshold, but even that may be too high.

As for the cost of responding, I simply don't believe those numbers about the high costs. I don't believe them for two reasons. One, I spent 30 years of my career doing energy and economic modeling for a national laboratory in which we estimated those costs, and none of the credible analyses I have seen suggest that the cost would be much more than a fraction of a percent of GDP.

But also on the personal level, I don't do very sophisticated things at my house, I don't have solar panels or even a solar water heater, but I have simple things like a clock thermostat and a timer on my water heater, and I do have LED lights now, I'm proud to say, but it's relatively easy to cut your emissions by 40 percent relative to the American average, as we've done in our home, and the president is the person to make that case, both to dispel any remaining doubt that this is a potentially catastrophic issue and that we don't have the means to deal with it. We do have the means.

SEN. LUGAR: Let me shift quickly in my time to the International Energy Agency. It appears to me to be -- and Secretary Clinton has discussed this in testimony -- that Chinese

membership of the IEA would be a constructive development because in that way, why, the Chinese come together with various others in terms both of the verification situation as well as an understanding of the international predicament. It's not a cure-all, but it's -- in our talk about cooperative diplomacy and movement ahead, the lack of Chinese membership in the IEA is conspicuous.

Have any of you given any thought to the efficacy of its membership or its importance?

Yes?

DR. LIEBERTHAL: I actually about three years ago wrote about that and encouraged U.S. leadership on trying to get China invited to join the IEA and to accept the invitation. The problem, as I understand it -- I believe this is still the case -- because the IEA really grew out of the OECD, it has requirements for membership that China objectively does not meet, and certainly, in the past, a big stumbling block has been some of the European members of the IEA who simply will not bend on those requirements.

So I think we -- I understand that we have diplomatically been encouraging the IEA to do something to get China in. China does some cooperation. My sense is we may have to try to develop a special category of membership, I don't know, a partnership or something like that, that would bring China effectively fully in, but without running into the qualifications issue.

If we succeed in offering that, I think it will take a lot of articulate diplomacy to get the Chinese to accept second-class membership, which is what that effectively would mean, and I don't know whether that would be successful or not.

So I agree with you the problem is real. I think the problem doesn't lie here, it lies in Europe, and we just have to try to work with that.

SEN. LUGAR: Well, you raise an important point about our diplomacy with European friends, in addition to the Chinese. However, if we're all going to approach this as a worldwide effort, we somehow will have to get over the nitpicking that is involved here, and I use that word advisedly. But, at the same time, as you say, the Chinese may be reticent to join anyway.

This is the whole problem of the diplomacy, and I think Secretary Clinton understands this, but I was encouraged at least that she was at least prepared to begin to tackle it.

Yes?

MS. ECONOMY: Can I just raise one issue? I actually had a visit from a staff member from the IEA last October. He suggested to me that they're actually not that interested in having China join the IEA right now because of issues of transparency, that the Chinese are not --

SEN. LUGAR: Yes.

MS. ECONOMY: -- ready to participate --

SEN. LUGAR: Precisely.

MS. ECONOMY: -- in that respect. So maybe there needs to be some capacity building done before the Chinese join in any form, actually.

SEN. LUGAR: Yes. Well, we're back to transparency, which you've illustrated so well, but, clearly, this is critically important. If we're talking about 380, 450, 500, at some point, I would hope even in this country, we will have visible thermometers or some illustration so the American people have some idea where are we this year, we are 390, heading to 391, or so forth. This takes for granted by that point a majority of us feel it's important whether we're at 390 or not.

But let's say we establish that that really becomes a pretty critical element in all of our longevity and that of our children and our grandchildren. Then this transparency becomes very acute to illustrate whether really 390 is the figure. How do we know in this vast area of China what, in fact, is going on in terms of CO2 emissions?

But, in any event, I really appreciate your answers.

And I ask, Mr. Chairman, as a matter of privilege that a letter that I've written to the administration asking for much greater exposition be made a part of the record.

SEN. KERRY: Absolutely. It will indeed.

SEN. LUGAR: Thank you.

SEN. KERRY: Thank you, Senator Lugar.

If I could just comment, Senator Lugar, on the Feldstein numbers in the CBO analysis, the Feldstein number of \$1,600 -- what I hope here is, as we go forward in this debate, which is critical, that we're going to have a kind of baseline, if you will, of how we're judging some of the costs that people are throwing around because the Feldstein numbers -- there's a range. The environmental -- first of all, the Feldstein numbers do not factor in any energy efficiencies. They do not factor in any of the final rebates to consumers that are given in the Waxman-Markey legislation. So it's not, in fact, a fair representation of an increase of cost.

The EPA has estimated, based on the actual Waxman-Markey bill, that as it currently -- and this was prior to even some additional changes being made which reduce the costs further -- that you are looking at about \$98 to \$140, and that's before further changes were made that reduced the cost even more.

It's interesting to note you get the EPA saying \$98 to \$140, you've got The Heritage Foundation which says \$1,500 a year up to \$1,750, and you've got the Republican National Committee saying \$3,100 a year. So we're going to have a range here that is, obviously, going to be based on interests that people are trying to express in the process.

What I want to do -- and I think we all have a responsibility to do it -- is to get a real economic model here. It is clear with the \$80 billion that we are investing in clean energy, alternative energy, renewable energy, et cetera, energy efficiency -- it is clear with the McKinsey Company report that has created a carbon cost abatement curve. We talked about that in Spain when we are the Aspen Institute.

It shows that about 35 percent of these reductions, for the first 10, 15 years, pay for themselves. That's not reflected in these models. Nor are any of the household income benefits, i.e. let's say more families are switching, as they will, I'm confident, as Detroit goes through a transformation. A lot more families are going to be buying hybrids and getting better mileage in their car. None of these studies reflect how much household income they're going to be keeping as a consequence of paying less for fuel.

So, while the per unit kilowatt hour may go up to some small measure -- and, as I've shown, I think it's a small measure in the end -- the actual out-of-pocket expenses of the household is going to be less because of the other efficiencies and gains that are going to come.

Now we have to, obviously, show this as we go forward, but even there was analysis of Indiana recently, which I will obviously get to you, that shows that with whatever cost increase there will be, there'll still be a continued economic growth in Indiana, recognizing what the Waxman-Markey bill is doing and what we're going to try and do in the Senate, which is significant mitigation against coal costs where I know you are dependent in Indiana.

And so I think that there's about \$1 billion a year of dedicated funding just for clean coal technology over 10 years, and there's a wait period before that even cuts in. So, while the bill would be passed, I think there's about a five-year period before it even becomes active that those reductions would have to take place. So you get \$5 billion of clean coal technology effort before there's even a requirement that they comply.

Our hope is that in the end we're going to be able to show that this is going to have a really marginal -- in fact, may even have in the first 15, 20 years a very beneficial net gain to households because of the efficiencies and other gains we put in.

Would any of you like to comment specifically on that or any of that modeling?

I see a huge willingness to leap into the fray here.

MR. CHANDLER: Well, again, that's what I used to do for a living, and I think if you take the net costs and the net benefits and include all of those factors in a general equilibrium model that is sophisticated enough to include exactly those technologies, the answer you get is exactly the one you articulated. I agree with your analysis completely.

SEN. KERRY: Mr. Lieberthal?

DR. LIEBERTHAL: Just the other layer I would stress is that as we move to the future, a lot of the competition in the global economy is going to be focused on innovation around cleaner energy and cleaner appliances, et cetera, so that the job opportunities out there -- it's

hard to factor in, you know, what jobs will we not get because the next Microsoft is being developed in China, not in the U.S., kind of issue, but if there's anything that's clear about the global future, it's that there is going to be an increasing premium on being able to be more energy efficient and more low carbon, and we're going to benefit from that if we're moving ahead, and we're going to miss that and be buying other folks' products if we aren't.

So, if there's a way to get that into the model, my guess is, Senator, it would make your argument still stronger, and I very much agree with your basic points.

SEN. KERRY: Mr. Chandler, what can we do about -- one of the things I did see when I visited an American-owned wind power company in China -- they're having trouble getting the central government. They're now going to go after the provincial, but central folks will not buy from the American companies, at least in the bidding that went out. It was only awarded to Chinese.

Now that's, obviously, one of those market-access, market-share issues that are going to be very important in this process, and I wonder if you could share with us any thoughts about how that might be addressed in the next months here.

MR. CHANDLER: That's a subject close to my heart. In a different incarnation, I started a business developing clean energy projects in China. It's still going. It's still successful. But getting a clean energy business started in China is very time-consuming, very frustrating, very expensive.

I think we spent a half a million dollars in legal fees before we even had the business plan in place. That's a function of having to get the business license, to get the approval for the foreign exchange, the foreign investment, to get all of the provincial and municipal leaders to stamp and chop the documentation, and then once you have all of those things, enforcing contracts, getting utilities to treat you fairly vis-a-vis the competition -- these are issues on which the U.S. government ought to and could help companies like ours, like that wind company.

I think it probably wouldn't take a lot of arm-twisting, but it does require paying some attention to those issues, understanding them and talking to the Chinese government about them and asking for their help. I frankly think that, at the very highest levels, many of the leaders in China simply don't get it because, you know, they haven't been in those trenches, and so bringing those problems to the attention of the leadership would be a contribution.

SEN. KERRY: I think, Ms. Economy, you specifically talked about -- not I think. I know you talked about the lack of the institutional technology capacity of the Chinese to do some of these things. A lot of people don't understand that, you know, in the sense that, you know, they're doing unbelievable buildings, they're building these railroads, et cetera, et cetera, they have great capacity technologically.

So can you describe more what you mean by that and how -- I know you talk about the California thing may be the way to address it, but I want to try to flesh out a little more how we might define those capacity-building tasks and go at it.

MS. ECONOMY: Okay. Thank you.

Let me just first go back to what Bill said. I guess I would take a slightly different tack, and I think it's going to take a lot of arm twisting for that wind power company. I mean, China puts into place many requirements, for example, 70 percent local content, right, for wind manufacturers in China, and in their most recent stimulus package, there was a big push to say that anything related to infrastructure development was going to have to be bought from Chinese companies.

So I think that there is significant work that will need to be done on those market-access issues, and I would guess that Ken could talk a lot about that, if he wanted to.

In terms of exactly what we --

SEN. KERRY: Well, is it a mistake to overly -- I mean, is it a mistake to confuse that -- is that a trade issue that belongs over here and, meanwhile, we've got to get the capacity building and do the other pieces that belong to the global climate change?

MS. ECONOMY: Well, I think, you know, capacity building is such a large and broad term, right, and I think there are going to be -- it's all going to be difficult, right. So the easiest thing to do is to begin with the Chinese laws as they're stated in regulations and then look to the Chinese to enforce those and then to help them enforce those laws. Above and beyond that, you know, sort of trying to get unfairness of Chinese -- or what we perceive to be unfair Chinese laws and regulations, I think, is another step again.

SEN. KERRY: Well, do you believe that come Copenhagen, we will have an ability to be able to measure sufficiently and that they will be able to report based on how we're measuring and it will be verifiable?

MS. ECONOMY: No.

SEN. KERRY: You don't?

MS. ECONOMY: No.

SEN. KERRY: You believe there's no capacity to do that?

MS. ECONOMY: Not right this minute. I mean, based --

SEN. KERRY: No. I mean by December.

MS. ECONOMY: Well, no, not by December. I mean, I think, you know, in terms of, for example, they have almost no capacity in rural areas to, you know, measure emissions. There's no inventory of greenhouse gas emissions.

SEN. KERRY: I'm not talking about measuring --

(Cross talk.)

MS. ECONOMY: Oh, I'm sorry.

SEN. KERRY: What I'm talking about is measuring the reductions. If they come to Copenhagen and say, "We are going to reduce emissions, and we're going to reduce them in the following sectors to try and achieve the following amounts," while they're not going to sign up to the same Annex I standard per the prior negotiations, there's no way we're going to get a legally binding agreement through the United States Senate or elsewhere if they're not reducing their emissions, and we're going to need to know that they are.

MS. ECONOMY: Well, I think what we would like to have is a baseline to begin with, right, which is -- we don't have that really, right, for all the sectors across the Chinese government. I think even with the targets that Ken mentioned in terms of the energy intensity reduction targets and the top 1,000 company program, the Chinese have -- you know, in the first year, they didn't meet their target; then, in the second year, they came closer; in the third year, they met it; now they're going to surpass it, my point being --

SEN. KERRY: Let me stop you for a minute.

MS. ECONOMY: Okay.

SEN. KERRY: When you say we don't have a baseline, we measured that China's emissions went up by some 300,000 megatons last year and that they are now surpassing us by X amount, and we are measuring their annual total emissions.

MS. ECONOMY: Right, but in terms of -- right. And I think that's largely from inputs, you know, of their energy use. I don't know whether that factors in emissions from methane and different kinds of soil and all those kinds of things. The kind of measurement that takes place in this country, for example, doesn't take place there, and in terms of the program that they initiated, I think LBL is trying right now to determine the reality, you know, sort of the verification of those energy intensity reduction targets. So I think it will be interesting to see how well they do in their efforts. I think there's always a problem with Chinese data.

SEN. KERRY: I have heard that, and I understand that, and I know that is an issue, which is why I'm trying to get at this now because if we don't get at it adequately, I think you have a problem trying to persuade some colleagues here that they're doing their share. You're going to have to have the ability to be able to measure.

Mr. Chandler?

MR. CHANDLER: I think there are two different categories of measurement. There are these aggregate measures, the energy intensity numbers, and then there are the specific measures of specific investments and specific projects, and in those cases, you have meters on the waste heat recovery power generators. You have meters on the wind turbines. You know how much they produce. You have to get approval for every RMB of investment so

you know how much investment is going in. You follow the tax data on how much coal is being consumed.

I personally think that this larger issue of additionality and measurement is an overrated issue. I think it's relatively easy to follow specific actions and measure their success, and that's -- if we're talking about enforceable and verifiable measures, I think you can follow those.

SEN. KERRY: My judgment is that, based on what we're aware they're doing -- and once we expand this cooperation, which is the purpose of these meetings -- we should be able -- it's going to take a team of people to be able to have access and to be able to share information, and we're going to have to work at it. I'm not suggesting it's like that, but it's doable. And we have to make sure it's done -- that's what I'm trying to emphasize here -- just because of the politics of this. I mean, how are you going to get this done? You're going to have to be able to have some standard in place.

Mr. Lieberthal?

DR. LIEBERTHAL: I think the Chinese are providing the best numbers they have, and I think they'll continue to do that. So I don't think that you're going to run into a problem. I hope I'm correct on this. I don't think you'll run into a problem of their making commitments at Copenhagen, then simply lying, you know, purposely to, you know, fake that they aren't meeting those commitments, but there are severe institutional limitations.

Some of these are technical, monitoring devices and that kind of thing. Some are the way the political system operates where reporting goes -- each of those five levels I mentioned earlier -- well, you know, the township reports to the county who reports to the province who reports -- you've got a -- I mean, from the city, to the province, and up, there's a lot of room for distortion and that kind of thing.

So, you know, you have to -- I think the trends tend to be correctly reported, but the absolute numbers -- they know they're working with a very imprecise system.

There are ways we can be helpful. I think if we develop a clean energy partnership with China, that will give us much more access to this, to the process, to the ability to work with them, to improve these things. The national-level leaders in China want desperately to get better numbers. So where we can help with database management systems and training and all that kind of thing, you know, I think we have partners there in that, and I think -- let me add just one other point, if I could, and that is I think one of the big tasks at Copenhagen is to develop better objective measurements globally.

A lot of what goes on globally now in CDM and other things are --

SEN. KERRY: I agree with you.

DR. LIEBERTHAL: You know, you can play with the numbers a lot, and that will apply to China, too.

SEN. KERRY: It will apply across the board.

DR. LIEBERTHAL: Yes.

SEN. KERRY: We have to find a mechanism.

Senator Lugar?

SEN. LUGAR: Just following through on this line of questioning, Mr. Chairman, it seems to me that this economy has brought forward a point of view which is important. That is if you're trying to gauge whether you're going up or down, there has to be a baseline to begin with, and there isn't here.

Now I think your point, Mr. Lieberthal, is that as we cooperate with the Chinese, we get a better idea of their measurements, a better idea of how they might even go about it. It still doesn't get to the rural China problem and the lack of measurement or almost any indication of whatever may be happening with hundreds of millions of people in the country.

This is why I think we have to be careful in our statements as public officials to give an impression that somehow we've quantified this now to any particular degree. We're sort of generally in the ballpark, but we get back to Mr. Chandler's point, whether we're in the ballpark or not, we believe that there are worldwide indications in this parts-per-million business that we are still adding year by year and getting close to what I hope will be a more comprehensive debate among scientists and the public so we understand why that is important, whether it's 450 or 500 or so forth.

I think if the American public really did understand even the indications you've given, that California has 12 months of fire these days or that parts of our country already are experiencing a severe agricultural difficulties -- perhaps these were not the most productive sections, but, nevertheless, we can see further creeping. Even facts of this sort are not well understood -- in fact, not very well publicized -- and with regard to this situation. So I appreciate, you know, the debates or discussion we're having.

At the risk of blatant self-advertisement, let me just say that the Lugar Center for Renewable Energy at Indiana University-Purdue in Indianapolis -- I have no vested interest in it. I do not manage the center, but it was named for me a while back because of my enthusiasm for the subject. And they're going to cooperate with Sun Yat-Sen University in China to host a forum for energy and environmental leaders really for the purpose of trying to bring some understanding to Midwestern states who will be participating in this. And Midwestern states have coal. Midwestern states have a number of situations that are critical to this debate whether we're doing it domestically.

So, this forum will occur in October, not too far from now. And before Copenhagen are in the midst of this. And I mention also something outside of that. An NGO known as CHAZ has been effectively working with Chinese officials to implement efficiency energy standards similar to our Energy Star program. This is still just another movement among many. But one which I endorse because it does get down to such things as refrigerators, air

conditioners, televisions. Ways in which NGOs who are subscribing to this can be helpful with Chinese residential occupants in reducing whatever they're doing over there.

I would just simply ask, as we've discussed this subject back and forth today, whether we've got accurate measurements or a perception of how bad the situation is. Likewise, can you help us quantify this in the future? We've talked about things occurring in climate change already in our country. And I don't stress that just simply in a nationalistic way that, for instance, Sri Lanka is unimportant. Or various parts of Africa and so forth. But in terms of our foreign policy, we do reach out to other countries.

We have had very good discussions, and Senator Casey was here earlier on today has been partner in a bipartisan bill to try to reorganize our food programs. Both from the standpoint of emergencies. But likewise in terms of productive agriculture, especially in Africa and Southeast Asia where about 800 million people are perpetually hungry and will remain that way without very substantial advances in their production, quite apart from any emergency food aid we can do.

Now, even while we're going about this, we're having this debate in another forum in which several of these countries are affected. At least many of the articles about Africa, for example. So, this is a pretty grim situation. Even with one hand, if we wanted to constructively try to help the green revolution occur in Africa which never occurred for a variety of reasons, including lack of productive agriculture. Single women trying to farm less than an acre with not very good seed and no fertilizer. And often very little prospects. And having to cart whatever they do two kilometers to get to the next road.

These are the realities in a world that is facing climate change in addition. So, I ask you as we proceed, we can understand this better in terms of American agriculture and therefore transpose it if we know really what to expect. For instance, it would be very parochial again, in my home state of Indiana, a big agricultural state. Soy beans, corn on my own farm. I'm interested in how climate change is going to affect that in this generation or the next.

Now, some have said not very much. Conceivably, even the growing season may be longer. On the other hand, you may have torrential rains that wash out the whole crop so that, growing season or not, you've got a problem. I just want to try to reduce this to something that is manageable and the understanding of all of this as to why this is important.

Are there any charts, graphs, data that indicate how agriculture in America, for example, might be affected? How the growing seasons or even the probability of crops, whether it be in the Midwest or the South or the West or New England or so forth, will be affected? Are you aware of literature or a good book that we could all read? Help us out if you can.

DR. ECONOMY: I'm a China expert, but I will say that I think beginning back in the early 1990s at least, there were climate modelers based in Princeton and other places that were doing precisely this kind of work and trying to sketch out within the United States by region how things like agriculture were going to be affected, not only from droughts and floods, but from increased pestilence, for example.

So, I am sure that there is literature out there. And I am happy to go and try to find it for you. But I know the Chinese have done this kind of work, so there's no doubt in my mind that we have as well.

MR. CHANDLER: I should add that in the modeling that I've seen done for the intergovernmental panel on climate change that we did in the Pacific Northwest National Lab when I was there, moisture distribution, which is so crucial to agriculture, is notoriously difficult to model into forecast. And so, the uncertainty of the impacts region by region is very high, which in some ways makes the situation even worse. Because if you knew that you were going to dry out, or if you knew you were going to have torrential rains on a regular basis, then you could adapt. But the uncertainty in the models, the large scale of the grids, makes it very difficult to deal with and increases the risk.

SEN. LUGAR: That's important for us to know, too, as people plan how to use their land over the course of time. Or what to anticipate in the next generation, for example, and the probabilities. I appreciate, as you say, you're an expert on China. This is related to China only so far as before we get very far with China, we're going to have to resolve some of these problems in the United States. At least in terms of our own understanding in our advocacy, or we will have diplomats out there in Copenhagen, or wherever they may be, who are doing the best they can, but back home is not really certain what the political atmosphere is backing whatever they are saying. And this is why the credibility of all of our activities at the grass roots is very important.

Let me just add one more factor, once again a blatant self- advertisement. My staff have very skillfully calculated how much money I'm saving each year by driving a Prius car. Now, many senators drive Prius cars, so this is not a unique experience coming into the Hart lot everyday.

But they've calculated 49 miles to the gallon over the course of four years of time figure, which we have shared with our constituents. Now, this doesn't mean that everybody has rushed out to buy a Prius or another hybrid car or something of that variety.

In other words, demonstrably there are savings in this. Hopefully, there will be in other things we do. Different kinds of light bulbs we're putting in and all sorts of renovations of buildings. But let me just ask, at what point, even if there are savings involved for households, lifestyles in the United States or in China take over really in people's decision-making. At what point is the economic thing important? At what point is fear of what is going to happen in terms of real catastrophe, more important. What are the motivating factors that in our democracy we will have to contend with?

But even in China, as you say, stability is the key factor. How much political pain can occur in the countryside or somewhere else before the government says, all we had were the most noble of ambitions here, Communist party retention comes first. Stability as opposed to what we're doing. Yes, sir.

DR. LEIBERTHAL: I'd like to make a comment about the U.S. side and a comment about the Chinese side. Although like Liz, I am a China specialist and a U.S. citizen. But I

think on the U.S. side, frankly, there is enormous capacity. And I mean this very seriously. I think there's enormous capacity to motivate people positively. Not only fear, not only comments about lifestyle. But Americans like to be good people. They like to do the right thing. I think if this is framed correctly, there is a lot of kind of positive motivation that can be generated. And then if it's backed up with things like smart metering in homes so that people can see everyday whether they're doing the right thing or not, I think that that is a combination that could produce at least some of the results we're seeking.

In China, the reality I think is that leaders increasingly see climate change itself as a threat to stability. Let me just give you an example of that. Currently about ? just a little under 50 percent of China's GDP is produced in three coastal areas. The Pearl River delta, the Yangtze River delta and along the Gulf of Bohai. Two of those are extraordinarily vulnerable to sea level rise. The Yangtze River delta, Shanghai and the surrounding areas are about one inch above sea level. And the Chinese have modeled out how much flooding will occur with each degree of rising sea levels. And it is ? almost mindboggling when you look at the results, especially in the Yangtze area.

The melting of glaciers in the Hindu Kush affect the major rivers that run all across China. It's everything to the Chinese water system. And no one quite knows the results, but they are very worried about them. And they see these as potentially producing large scale displacement that can be catastrophic for the country.

So, I think actually the leaders don't see stability versus climate change. Should we focus on stability or focus on climate change? They have their ways of trying to assure stability, but they see climate change as something that they've got to adapt to and mitigate, or there will be no way to maintain stability over the long run. I think that argument is one that they accept very readily.

SEN. KERRY: Thank you. That was an important point. And we appreciate it. Senator Cardin.

SEN. BENJAMIN L. CARDIN (D-MD): Thank you, Mr. Chairman. And I thank our witnesses for being here today. I'm working with the Chairman in an effort to try to advance climate change legislation in this Congress. I think that we need to move forward on it, even if we were the only country in the world to move forward on it. Because I think it would be good for our nation. It would create clean jobs here in America, keep the technology here. It's important for our economy.

But I want to go into an area that I hear frequently in my state, the state of Maryland. A state that had a proud tradition in textiles, which no longer today. A state that used to be more heavily involved in manufacturing than it is today. In which many of my constituents say, well, if the United States enact strict standards on carbon emissions, all it's going to do is make it easier for China to have a larger penetration at the U.S. market. Because they won't impose the same strict standards. And then you're putting U.S. manufacturers and producers at a disadvantage in regards to international competition.

Now, this issue was recognized last year in the Lieberman-Warner Bill that made its way through at least the Environment and Public Works Committee. And in that bill, there was a provision that would have triggered some form of an import tariff against countries that imported products into the United States that didn't meet the U.S. standards on carbon reductions. So, to try to provide a level playing field for products entering America from countries that were not dealing with the global climate change issue.

Now, that trigger was down the road. So, it was sufficiently far down the road that many of us thought it would not generate a lot of interest as far as the challenges within the WTO or public relations issues with countries that we deal with. I want to get your views as people who understand more than I do what's happening in China. There's two ways we could go in this issue, and perhaps three. One is to do nothing. The other is to try to impose some type of a unilateral tariff to reflect what we believe should be the international commitments, perhaps using standards later this year adopted in Copenhagen. And the third would be to try to negotiate within the World Trade Organization some recognition of the fact that it is legitimate for countries that have an interest in advancing global climate change to establish this type of regime.

So, I guess my question to you, how would this go over in China? Now, our relationship with China is somewhat mixed. The trade issues have been subject to a great deal of debate over time. China, of course, has the largest surplus with the United States of any country. We certainly are concerned about this balance of payment. There are legitimate concerns that we don't want to enact legislation here that would exacerbate the trade and balance we already have with China.

DR. LIEBERTHAL: I think, Senator, first of all, I understand the sentiment behind the legislated proposal. The Chinese, I think, number one, are very worried that American environmental efforts will be used to establish protectionist walls around the American market. You hear that all the time in China. And especially at a time of global economic stress that worry is, if anything, heightened.

But secondly, there's a more fundamental issue at stake and Senator Kerry raised this earlier. And that's the question of whether the U.S. is seen as using a concern about the environment to try to slow down China's economic growth because we're worried about China as a global rival. And the Chairman indicated that earlier that was a major concern in China. Now that is fading somewhat. I think at this central leadership level it has faded considerably. But at a popular level it is still a very, very widespread concern.

And if we do establish barriers at the border as part of our cap in trade legislation, I think that will be seen in China by many as kind of confirming their view that this is really aimed at China. Not on competitiveness in the sense that it's seeing up here on the Hill. But rather as a strategic move to try to keep China from realizing its own rightful potential.

My own sense is the best way to think about this should be, if China were to do nothing, or do very little to control its own carbon emissions, then I agree. We really need to worry about the competitiveness issue going forward. But if China is making a maximum effort, verifiable, then I think that we ought to back off a little bit. And especially if we are not

willing, being a much richer country, to provide some funds and that kind of thing to help the Chinese meet the standards, then I think we ought to be a little bit more sensitive to the reality that we have more money, we have higher tech industry. We are somewhat late to the climate game. And we are not fully trusted out there on this issue.

SEN. CARDIN: I would just point out that Americans would believe that we already are helping China with money since we have such an imbalance with them. So, they clearly have a cash surplus with the United States.

DR. LEIBERTHAL: That's absolutely true. Behind those trade statistics ?

SEN. CARDIN: I might say some would also argue that China has arbitrarily kept its currency low, holding down the growth ? the wealth of its country at the cost of the United States so that we really are contributing to China's development. So, aren't we already contributing to what we would think they should have used to deal with reducing its carbon emissions?

DR. LEIBERTHAL: There are, I guess, three points to make in response to that, sir. One is, is China's exchange rate below what a market would have dictated? And the answer is yes. I agree with you. Second, is the trade imbalance with China something that we should take extremely seriously as a bilateral issue? I think the answer to that is not quite. Our trade deficit with Asia as a whole, as a percentage of our global trade deficit, has gone down virtually every year since the early 1980s. Our trade deficit with China within Asia has gone up.

But it's because the other countries of Asia that used to run huge trade surpluses with us, Japan, South Korea, Taiwan, Hong Kong, Singapore, have all shifted their final assembly to China. And so you have for the average Chinese export to the United States two-thirds to three-quarters of the value of that China imported from elsewhere in Asia, bolted together in China, packaged and sent to the United States. We attribute that all to China. But it isn't.

SEN. CARDIN: I understand what you're saying. But still the trade imbalance, the total trade imbalance on U.S. internationally is troublesome.

DR. LIEBERTHAL: Absolutely.

SEN. CARDIN: And China is the major player in that.

DR. LIEBERTHAL: Well, actually, China is now part of a regionally integrated Asian manufacturing system. I don't want to split hairs here, sir. But our trade deficit with that Asian regionally integrated manufacturing system has actually gone down as a percentage of our global trade deficit steadily for 20 years now. So, I think pointing to the China component of that and saying, well, that's explaining our problem, it doesn't really identify the problem. Our problems are more that we don't have enough personal savings, and there are a lot of systemic issues involved. The China figure is very attractive to point to because it's so dramatic. But it really masks the real supply chains and flows of goods that describe what's actually taking place out there.

SEN. CARDIN: But you did say that if China does not take respectful action in regards to carbon emissions, then it may be appropriate for the United States to take some action.

DR. LIEBERTHAL: If it doesn't. I believe it is actually already doing quite a bit, and I think it is prepared to do quite a bit more. If the U.S. and China cannot begin to cooperate on a serious level to address carbon emissions, to produce some real results that are verifiable, that are not just rhetorical, I would agree with you that the political case for some kind of trade action, especially in the future so it incentivizes the Chinese would be hard to resist.

I personally wouldn't favor it, but I can certainly understand the political case for it. But I do believe that there is now an opportunity to engage the Chinese very substantially. And I would add that the Chinese are already at a national level doing more than most Americans realize in concrete programs to reduce their carbon emissions versus what they would have done without those efforts.

SEN. CARDIN: Our Chairman reminds us of that frequently here, sir.

DR. ECONOMY: Could I just add one thing to that?

SEN. CARDIN: Absolutely.

DR. ECONOMY: I think there are real issues in our trade relationship with China. We should address them whether it's intellectual property rights, market access or the currency issue, as you suggest. My fear is that establishing some kind of carbon tariff on goods coming from China is going to provoke a whole round of similar issues and tariffs and other kinds of penalty measures. Not just between U.S. and China. But it could happen around the world. And this is very counterproductive, I think, to what we're trying to do with this global climate regime.

I think when you look at the history of international environmental treaties, some of them have sanctioning mechanisms. Montreal Protocol on ozone depletion has a sanctioning mechanism in it. So, my feeling is if we want to try to develop a sanctioning mechanism within the framework of Copenhagen, then that's where we should do it. But not as a bilateral kind of punitive measure against one country. And it will have all sorts of far-reaching negative ramifications for the U.S.-China relationship as well.

SEN. CARDIN: But if China does not become party to that, then first the mechanisms would not have any impact.

DR. ECONOMY: Well, when we weren't party to Kyoto, the Europeans were talking about what they might do to us.

SEN. CARDIN: It might. But then you have WTO to fall back on. Unless you have some other agreement, it seems to me if they're not party to it, enforcement would be very difficult. And, of course, even within the WTO, America's record hasn't been great on enforcement issues.

DR. ECONOMY: No, that's true, we haven't been great on enforcement. But I think you can certainly find ways to penalize countries that are not part of the agreement.

SEN. CARDIN: I'm not sure.

SEN. KERRY: Thank you. Well, the key is obviously to have a framework where they're part of the agreement. And that's what we're all aiming for. That's the effort here. And hopefully, we'll get there. I believe that that is going to be possible, albeit as we have all articulated with the differing responsibilities that we accept. At least in the first years there has to be a melding here, and that's one of the things that I tried to make as clear as I could within my portfolio to the Chinese, that whatever happens there, we're going to get together every year, we're going to be reviewing it. And we're all going to have to be ready to react to the scientific realities as they continue to come in. And I think how many years, that's going to be up to the negotiators and the administration and their relationship with China. But clearly that's going to be part of this.

Are there any other issues for us, Senator Lugar? If not, this has really been very helpful and informative. And I hope we can continue to call on you as we go forward in the next months. And I thank you very, very much for being here today. Thank you. We stand adjourned.

END.