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I wish to thank the Commission for giving me the opportunity to participate in this hearing. I consider the topic, “China’s Energy Policies and their Environmental Impacts,” to be one of great importance. I believe there are misunderstandings in both China and the United States surrounding this topic that cause both countries to miss opportunities for fruitful collaboration. Perhaps the greatest of these misunderstandings is the failure to recognize that China has in the past (1980-2000) and is again putting tremendous effort into reducing growth of energy-related CO₂ emissions through the design and implementation of aggressive and innovative energy efficiency policies.

I wish to stress two points: The first is that China and the United States, accounting for nearly 40% of current global energy-related CO₂ emissions and having the largest potential to reduce emissions growth, need to work cooperatively to establish a global regime in which these emissions are contained. The second is the need for assistance from outside for China to successfully limit these emissions. I suggest that China, without assistance in reducing greenhouse gas emissions, could triple or even quadruple emissions over the next 20 to 25 years. With serious assistance from industrialized countries, especially the United States, the increase in emissions could be cut in half. The second outcome makes it possible to conceive of a future in which the worst effects of global climate change are averted; in the first case, such a future is difficult to imagine.

I have three major recommendations for the United States government:

1. The United States and China should engage in formal and regular discussions of ways of working together to reduce greenhouse gas emissions, with the goal of influencing global negotiations. A serious proposal that both the United States and China agree to is likely to be acceptable to both industrialized and developing countries.
2. In the near term, the greatest support that the United States can provide to China (and other developing countries) is to build capacity in those countries to create and implement policies and programs that reduce greenhouse gas emissions. The United States should play a leadership role, creating a program at the level of \$500 million per year (~\$200 million of which is for China). The United States should strongly encourage other industrialized nations to fund such programs as well.
3. In the long term, the solution to climate change will have to rely on technology that is not yet commercialized. The United States government should play a key role in establishing a basis for performing R&D on these technologies with other

¹ The views that Dr. Levine expresses in this statement and his subsequent testimony are his and do not represent the position of Lawrence Berkeley National Laboratory, the institution that employs him or of the U.S. Department of Energy.

nations (including China) and the sharing of intellectual property of these future technologies among nations of the world.

I urge the Commission to consider these ideas and recommendations seriously, in light of the statement that I provide below.

Qualifications

Let me first state my qualifications. After receiving a PhD from the University of California, Berkeley, in chemistry, I turned my attention to the study and analysis of energy issues. I have specialized in energy efficiency, including technology, economics, and public policy. I have worked in the energy field full-time since 1972, first for the Ford Foundation (two years), for SRI International (four and one-half years), and finally for Lawrence Berkeley National Laboratory [LBNL] (30 years). In addition to management and research responsibilities at LBNL, I have participated as a senior leader and author of major reports on energy efficiency and energy futures for the U.S. Department of Energy, the World Energy Council, the Agency for International Development, the Environmental Protection Agency, and the Energy Foundation's China Sustainable Energy Program.

Two aspects of my background are of particular relevance to this testimony. The first is my involvement over the last 20 years in the three analyses carried out by the Intergovernmental Panel on Climate Change (IPCC). I served as convening or coordinating lead author for two of these three assessments. The second aspect is my creation and leadership of the China Energy Group at LBNL. Since its formation in 1988, this group has worked collaboratively with Chinese organizations to further energy efficiency policy in China. As a result of leading this group, participating in research projects, and having many discussions with energy policy officials and researchers over these 20 years, I have gained knowledge of China's energy system, its approach to policy and policy implementation, and individuals who are involved in energy decision-making.

LBNL's China Energy Group

I've been asked to describe the China Energy Group at LBNL. The Group came about as a result of a U.S. Department of Energy sponsored conference on China's energy markets held in Nanjing, China in 1988. The leaders of the Energy Research Institute, the Chinese central government's leading research and analysis organization supporting energy policy decision-making, expressed a strong desire to establish ties with energy specialists outside of China. At that time, their contacts were almost entirely within China. After discussions, we drafted a plan for cooperation and collaboration. They submitted the plan to higher authorities in their government and received very rapid approval. On our part, we agreed to do our best to create an ongoing program of collaboration with a strong focus on energy efficiency policy.

With initial funding from the U.S. Department of Energy – later from the U.S. Environmental Protection Agency, then from foundations and private industry – we began a collaboration that has continued for 20 years. LBNL's China Energy Group has built up a staff of seven researcher/analysts and has collaborated closely with scores of research, analysis, and policy-related organizations in China, including bureaus of the central government. Our most significant achievements are these:

- the introduction of techniques for analyzing appliance efficiency standards, which has led China to analyze and adopt close to 30 appliance standards and form organizations within the Chinese government for a continuing program;
- the creation of a voluntary energy efficiency agreements between China's government and industry – modeled after similar agreements in the Netherlands and the UK – which is now the underlying programmatic approach of the Chinese government to industrial energy efficiency;
- the founding with a partner national laboratory of the Beijing Energy Efficiency Center, which is the leading group in China for analyzing energy efficiency policy and managing large energy efficiency programs funded by international organizations;
- at the behest of the Energy Foundation and working with the Packard Foundation, the creation of the China Sustainable Energy Program (CSEP) at the Energy Foundation, a program that supports energy efficiency and renewable energy policy research for China. The annual budget of CSEP has grown from an initial \$5 million to \$18 million today; and
- the development of state-of-the-art tools and data collection and synthesis to permit analysis of China's energy future.

More information about the China Energy Group at LBNL can be found at <http://china.lbl.gov/>.

Issues

You raise five very important and interesting issues in your letter of invitation. I wish to focus my attention on the fifth of these: “What steps is China taking on a governmental and non-governmental level to address the environmental impacts of its energy use? What role can the United States play in addressing these problems?” I will address the environmental issue that I believe is of the greatest importance: the role of climate change in the relations between the United States and China.

My thesis is that progress toward a solution to the problem of greenhouse gas emissions depends critically on both China and the United States and that deepened bilateral cooperation would greatly increase the likelihood of finding an effective way to move forward. China and the United States produce approximately equal levels of energy-related CO₂ emissions² and together account for almost half of such emissions worldwide. China is projected to account for more than 40% of new energy-related CO₂ emissions globally between the present and 2030, thus being by far the largest future contributor to increased concentrations of CO₂ in the atmosphere. The United States, meanwhile, has the greatest potential of any country in the world to reduce energy-related greenhouse gas emissions, for two reasons: first, because the U.S. per-capita intensity of these emissions is considerably higher than those of other large industrial countries (e.g., 2.5 times that of the European Union and 2.1 times that of Japan); and second, because the United States has the scientific, technical, and economic capability of developing viable alternatives to fossil energy technologies and is likely to be the world leader in any breakthrough technology if one is developed.

² Energy-related CO₂ emissions make up approximately 80% of total of such emissions to the atmosphere.

It is not enough that China and the United States both take steps to reduce CO₂ emissions. *It is essential that the two countries do this cooperatively.* As long as China does little to reduce growth of greenhouse gas emissions or appears to be doing little, it will be politically difficult for the United States to sign a binding international treaty that commits to a serious cap on emissions. And as long as the United States either does little or appears to be doing little, it's impossible to imagine China committing to any international treaty that limits its own emissions. This is a vicious circle in which neither country will act boldly unless the other acts first, and neither appears willing to act first.

Agreement on Factual Information and Generally Agreed Viewpoints

In my view it is very desirable that a relatively short list be crafted that contains commonly accepted information that senior government officials of both China and the United States would accept as accurate, balanced and fair in depicting the historical, current, and anticipated future situation of the two countries regarding greenhouse gas emissions. Below are 10 items that could form the basis of a common understanding.

Both countries

1. The United States is responsible for 28% and China 8.5% of total cumulative emissions of CO₂ from energy consumption ^a

China

2. From 1980 to 2000, China limited the growth rate of energy demand and concomitant CO₂ emissions to less than half that of GDP. ^b
3. From 2001 to 2006, China's energy demand and energy-related CO₂ emissions grew faster than the 10% annual growth of GDP. This led to an increase in China's emissions from 12.7% of global emissions (2001) to 18.4% (2006). ^c
4. In 2006, China instituted a national program to reduce energy intensity (energy demand per unit of GDP) by 20% by 2010. The program started slowly but is now approaching its annual target. ^d
5. Over the next 25 years, China will be the world's largest annual emitter of CO₂ by a considerable margin. ^e

United States

6. From 1975 to the present, the United States reduced the growth in the magnitude of its energy-related CO₂ emissions more than any other large industrialized country in the world. GDP per capita grew almost 200% while energy consumption (and CO₂ emissions) per capita remained constant. ^f
7. Notwithstanding these reductions in growth of CO₂ emissions, U.S. CO₂ emissions per capita are 2.5 times greater than those of the European Union countries and 2.1 times those of Japan. ^g
8. Annual growth of energy-related CO₂ emissions in the United States in the coming decades is expected to be in the range of 0.5 to 1.0 percent unless new policies are enacted to cut CO₂ emissions. ^h

9. The United States is actively developing advanced technology to cut CO₂ emissions through low carbon energy supply and energy efficiency technologies.ⁱ

United States and China

10. Neither China nor the United States have agreed to binding commitments on greenhouse gas emissions. China is a signatory to the Kyoto protocol, but the protocol contains no binding commitment for developing countries. The United States has not ratified the Kyoto protocol.

Notes

^a The most important measure of contributions of energy use to greenhouse gases in the atmosphere is the cumulative emissions of CO₂. This is because of the long residence times of CO₂ in the atmosphere (>100 years); thus contributions many years ago affect the global greenhouse as much as emissions today.

In describing contributions of a country, it is useful to present this in terms of per capita emissions, in the same way that GDP/capita, not GDP, is a measure of the economic well-being of a country. China's cumulative per capita emissions of energy-related CO₂ are less than 8% of those of the United States.

^b This is generally seen as a remarkable achievement, as virtually all countries undergoing very rapid economic development – China had 9-10% annual GDP growth over those two decades – experience energy growth that is *faster* than GDP growth. China's reduction in energy demand growth was the consequence of explicit policies carried out in China. If energy had grown just at the rate of GDP, China's emissions of CO₂ would be more than twice as great as today's emissions.

^c It is noteworthy that in 2006 the energy intensity decreased by 1.3% (i.e., energy grew 1.3% less rapidly than GDP) and by 3.7% in 2007, with greater intensity declines projected in 2008.

^d This is virtually identical to a goal of reducing the intensity of CO₂ emissions by 20%.

^e For example, the International Energy Agency in its 2008 World Energy Outlook anticipates that 40% or more of energy-related CO₂ emissions at a global level will be produced in China between now and 2030.

^f The reduction in growth of emissions is relative to a baseline in which CO₂ emissions grow at the same rate as GDP. For industrialized countries, emissions are unlikely to grow at this baseline rate because many activities and products have saturated their markets: for example, not many people are purchasing their first car, virtually all homes have refrigerators and most are not seeking to have a second. However, it is useful to use a baseline that has CO₂ emissions growing at the rate of growth of GDP when making comparisons among countries.

^g EU and Japan are not far behind the United States in GDP/capita. However, these nations have much less land per capita and have much higher population densities. High population density reduces travel demand and results in smaller per capita living space, thus causing lower energy demand. Policies in the countries promoting efficient energy use vary among the countries as well.

^h The Energy Information Administration's base case projects U.S. per capita CO₂ emissions declining by 0.2% per year between 2006 and 2030. The EIA base case projects total energy-related CO₂ emissions growing by less than 0.6% per year during the period. See <http://www.eia.doe.gov/oiaf/forecasting.html>.

ⁱ Any new international climate treaty is likely to include some means of sharing advanced technologies for GHG mitigation that are developed by the United States and other countries.

A Matter of Perspective: Predominant Viewpoints of China and the United States

Perspectives on responsibility for curbing greenhouse gas emissions and the impacts of doing so are very different when viewed from the Chinese and United States sides.

I will mostly address the two perspectives of China's emissions—as these may be somewhat less well known in this country. For our purposes, we need to consider the past, present, and anticipated future.

United States perspectives

Many in the United States look at China's emissions, note how rapidly they have grown in the past five years, and are aware of the forecasts that show that a large proportion of the world's expected increase in energy-related carbon dioxide emissions will come from China. For those who are concerned about global climate change and its possible serious and adverse impacts, emissions from China are a cause of grave concern.

Many Americans express the concern that emissions reductions applied to this country could increase the cost of our producing goods and services, thus placing us at a competitive disadvantage with any country that does not do the same. As a result, there are strong sentiments in many quarters in the United States that we should not agree to a cap on our emissions if China does not do the same, especially in light of China's large trade surplus with the United States.

Chinese perspectives

The view from China is very different. Chinese note that per capita income, energy consumption and CO₂ emissions are much lower in China than in the United States. They emphasize the disproportionate contribution of the United States to the global greenhouse gas problem, pointing out that the United States, with a population one-quarter the size of China's, is responsible for putting far more CO₂ in the atmosphere than has China. This point is made to indicate the inequity inherent in focusing on current emissions while the problem is caused by emissions over long periods of time.

These views provide a philosophical underpinning that supports China's major concern looking forward. China believes that it will need more energy for development—much more. Chinese officials observe that the industrialized countries have already been through the energy-intensive phase of their development, but China is in the midst of its own. The possibility of gaining a competitive trade advantage through a new climate treaty is much less significant to the Chinese than the possible roadblocks to achieving social development goals that could be brought by a commitment to binding targets.

Reconciliation (or Identification of the Key Differences)

It is important to understand how both sides see the problem. Considering these viewpoints leads me to believe that there are the two major impediments to agreement: the Chinese view that a binding commitment on CO₂ emissions could stifle their development; and the U.S. view that because of its large trade deficit with China, any adoption of a carbon dioxide cap without a comparable commitment by China could drive the two nations' trade balance out of control.

There are of course many other issues that are of domestic importance to an agreement to limit greenhouse gas emissions, but these are the two that the United States and China

need to work out together for them to jointly take a leadership position in their spheres of influence--industrialized and developing countries, respectively.

Forging Agreements

Continuing discussions between high-level teams from both countries are needed to discuss ways of overcoming the existing impasse in both countries. The leaders of the teams should be policy makers above the level of the climate change negotiators. These discussions should become formal. They need to be carried out on a regular schedule. Today they are informal and do not occur regularly. They should not be construed as bilateral negotiating sessions. The two countries can set the rules for their discussions. Ideally, they would keep key decision-makers in the U.N. process informed of developments in their discussions. However, if keeping information about the discussions private to the two governments increases the likelihood of progress, then the two countries may choose to maintain confidentiality. The goal is for China and the United States to reach a consensus that can serve as a model for the EU and developing nations.

Now to the difficult issue: what would such an agreement look like, at least in outline form? While there are many complex issues, I believe that reducing the discussion to the minimum number of critical ones is most helpful in moving forward. In addition to satisfying the U.S. and Chinese teams, the negotiation must produce an agreement that is appealing to the international community engaged in climate change negotiations. This means in effect:

For the international community:

- The agreement must contain binding commitments in some form and they must take effect in the near term.³

For China:

- If there are binding commitments, they must not threaten China's growth and internal development goals;
- The agreement must include giving China access to knowledge, tools, and technology that lowers the cost of reducing emissions;

For the United States:

- The terms should not exacerbate the U.S. trade deficit with China;
- The United States must be convinced that it can meet the commitment to greenhouse gas reduction at economic costs that are acceptable to its population

With the exception of the last bullet, which is well beyond the scope of China/U.S. relations, there are various ways that these objectives can be met. Considering the second bullet, a formula that could work in China is a commitment that industrial emissions would grow slower than industrial value added—for example, 80% as fast—over the next decade, after which time a new formula could be agreed upon. The advantage of this

³ The nature of the binding commitments can be very different for the two countries. For the United States it might be an absolute limit of greenhouse gas emissions in a given year, if the approach being pursued by other industrialized nations is adopted. For China, it might be a limit that increases as economic activity increases, thus complying with the next bullet.

approach is that it places no constraint on its consumer economy, which China views as necessary to meet its development objectives. A further advantage is that it addresses the sector that is responsible for 70% of all energy-related emissions; it thus addresses the activities in China that are by far the largest contributor to greenhouse gas emissions.

There are other formulas that could be used for China as well. Most involve adoption of an emissions target that increases as GDP increases, thus assuring China that growth need not be impacted so long as proper measures are taken to reduce growth of greenhouse gases. Like the industrial emissions approach, the formula could involve a commitment that GHG emissions grow at a rate lower than that of GDP (e.g., 80% as fast) with the provision of technical support, capacity building, and/or funds to facilitate reductions in greenhouse gas emissions. Achieving better results could trigger greater levels of assistance.

It is important to understand the nature of the assistance that is needed and appropriate. There are many misconceptions about this topic.

I believe that there are two primary needs. In the short term – the next one to two decades – China’s primary need is in technical assistance and knowledge transfer. This is often called capacity building. To illustrate short-term needs, I use our work as an example. LBNL provided in-depth training to China in the design, analysis, and implementation of appliance energy efficiency standards, starting in the early 1990’s. We did this after receiving assurances that the Chinese government would promulgate standards if they gained the expertise to do so. As they promised, they issued efficiency standards for refrigerators eighteen months after the training began. This training continued for almost a decade, as the Chinese learned the many different techniques to assess energy efficiency in many residential and commercial appliances and heating and cooling equipment. Today, China has standards for twenty-two different household products. The government has created permanent institutions to develop and promulgate these standards and check compliance with them. The standards are expected to reduce CO₂ emissions by more than 100 million metric tons by 2020. Valued at \$20/ton, this is \$2 billion.

This demonstrates the tremendous leveraging that can result from modest investments in capacity-building projects. It is an example of how technical assistance can have a large impact on China’s CO₂ emissions. The cost is very small fraction of the benefits from emission reductions. The assistance develops the capacity for the Chinese to pursue energy efficiency but does not pay for it. Chinese consumers pay the higher cost of more efficient appliances; they also receive the direct economic benefits of lower energy bills.

In my view, an appropriate-sized program for the United States to support is on the order of \$500 million per year for all major developing countries, of which China’s share might be \$200 million per year. A program at this level, with comparable contributions from other industrialized countries, has the potential to reduce the growth in annual energy-related CO₂ emissions in China by 50% over a twenty year period, if China participates actively.⁴ Substantial support from other countries could increase these impacts in proportion to the magnitude of the program.

⁴ I describe this proposal in more detail in a separate paper. I can make this available to the Commission on request.

The second need is for the longer term, where new low-carbon technologies will be essential if energy-related CO₂ emissions are to be reduced to low levels. For the most part, such technology does not exist today and the intellectual property for these technologies does not belong to anyone (i.e., does not exist). There is a need for programs to support joint development of such technologies, using the technical and financial resources of many countries. It is also essential that new procedures be developed that permits the sharing of licenses and royalties from these technologies. There are substantial advantages to the United States and China working together (along with other nations) to carry out R&D on low-carbon technologies. If the governments of both countries support the research, they can establish the rules for the sharing of intellectual property. A more complicated problem concerns the other developing countries which do not possess the large R&D capabilities of China (or India) but will need access to these technologies to reduce their emissions. The sharing arrangements need to be extended to these other countries as well, and terms for this sharing are needed.

A new approach is needed for sharing intellectual property for low carbon energy technology, ideally under the auspices of the climate change convention. Because this is a subject that is of paramount importance to China, a bilateral agreement between the two countries on collaborative R&D and the sharing of intellectual property on low-carbon energy technology could be an excellent model for a global approach to the problem.

This leaves the issue of trade. There are different ways that this issue can be dealt with. I will describe one. For this purpose, I assume that the signatories to a climate change treaty will agree to a cap on emissions that establishes a price for carbon credits. This is the system that the EU has adopted and that California and other U.S. states are developing. The EU system with a cap that constrains emissions has resulted in the past in CO₂ credits of about \$20 or \$30 per metric ton. To avoid impacts on trade in a case where limits on Chinese emissions in early years would produce only small increases in the price of its products for export, China would agree to a tax on exports equal to the cost of a carbon credit (dollars per metric ton). To avoid this being too cumbersome, it would apply only to products that are energy- (and therefore carbon-) intensive in their manufacture. Under this proposal, China would collect the tax and would be required to apply it to its program of reducing CO₂ emissions.

A program such as this would eliminate the trade advantage that China might gain by not having commitments as tight as industrial countries. It would have the further benefit of assuring resources in China that would be used to address greenhouse gas emissions.

An international commission would be needed to oversee the uses of the tax in China (and presumably other developing countries, if the approach is extended to them) as well as the provision of resources from the United States and other industrialized countries to support greenhouse gas abatement in developing countries.

Issues

I expect that the approach described above, if taken seriously considered, will raise issues in various quarters. I address two of the most likely objections.

If the United States agrees to a cap on absolute quantity of emissions, why should China be permitted a cap that depends on economic growth?

In the United States economic growth and energy use over a period of a decade or longer are relatively predictable. Absent a multi-year recession (such as that experienced by Japan), annual economic growth is unlikely to be below 1.5% or above 3% over a period of a decade or more. Growth in annual energy demand and energy-related CO₂ emissions, without new policies, is likely to be in the range of 0.5 to 1.0%. Forecasts in this range apply to most industrialized countries, for which most consumer products such as refrigerators and cars have already approached saturation. In short, it is possible to understand at a general level what is entailed in achieving certain targets for greenhouse gas emissions over a period of one to two decades.

For a rapidly developing country such as China, growth in energy demand and resulting CO₂ emissions can have much greater variations. The Chinese economy grew at annual rate of 9 to 10% from 1980 to 2000; during this period energy demand grew at an annual rate of 4 to 5%. In only one year during this period did the increase in energy demand growth exceed even 60% of that of GDP. From 2001 to 2005, GDP in China continued its growth at 10% per year or greater. One might have predicted that energy demand in China would have grown at a rate lower than 5% per year, as it had done over the previous 20 years. Indeed, forecasters did predict this. But energy demand grew even faster than GDP during the period, averaging almost 12%/year.

There are reasons that, in retrospect, explain this very rapid growth in energy demand. It's not necessary to go into them here. The important point for our discussion is that it is extremely difficult in China, in its present stage of economic development, to predict with any accuracy the energy demand growth over a 10 or 20 year period. This is one reason that China would not—and should not—accept a binding cap that is expressed in absolute terms, unless such a cap were well in excess of the higher range of expected emissions. But if a cap were set so high, it would be meaningless.

There are of course philosophical reasons why it is not appropriate to set absolute caps on a developing country that is in the stage of building infrastructure – houses, roads, medical facilities – to serve its population. But I wish to avoid philosophy in this discussion, as such matters often pull Chinese and Americans further apart instead of creating common ground on limiting greenhouse gas emissions. I believe the basic considerations, such as whether China should have an absolute or relative cap on emissions, can be made separate from philosophical views for the reasons that I advance above.

China and other developing countries will have the largest emissions in the future. If we allow them to have a cap that increases as their economies grow, how will it ever be possible to achieve acceptable levels of emissions?

Many people believe that China will continue increasing its energy demand and spewing CO₂ into the environment forever, or at least for a very long time. This is, I believe, a fundamental misconception. China is in the middle stage of building its infrastructure – housing, commercial buildings, roads, hospitals, schools, and the like. It is at a relatively early stage of increasing the mobility of its population. Large quantities of energy are required to accomplish these tasks.

This period is likely to last for 15 to 20 years, possibly as long as 25, depending on whether China continues at its breakneck speed of construction and whether large numbers of rural dwellers continue migrating into urban areas. At the end of this

construction period, China's economy will be much like developed countries of today. Energy demand growth will decline markedly, just as it has in the industrialized world today. Scarcity of traditional energy sources may slow energy demand growth even further in this time horizon.

The key questions are these: What will be the nature of China's energy system in 15 to 20 years? How much will energy demand and CO₂ emissions have grown? How dependent on fossil fuels will China be? What will be its overall contribution to global CO₂ emissions? Will the energy system in China's future be sustainable or will it lurch from crisis?

These are crucial questions not only for China but for all of us. One can envision a world in which China's energy and CO₂ emissions grow more than fourfold in 20 years, thus catching up with and overtaking large industrialized nations (except the United States and Canada) in per capita emissions. One can also imagine a China in 20 years in which CO₂ emissions have grown less than twofold as a result of implementing advanced energy technologies and furthering of policies to cut energy demand growth.

Assuming that global climate change is a serious matter, as I do, I have little doubt that the first case would result in very serious impacts on the global environment. The second case is much more tolerable. If accompanied by aggressive reductions of greenhouse gas emissions in industrialized countries and the aggressive development of low-carbon energy technology, the world could be well on the way to cutting emissions in half by 2050, an important objective, for example, my understanding of the analysis conducted by the Intergovernmental Panel on Climate Change.

The point here is the one I emphasize throughout this statement: If we succeed in working cooperatively with China to reduce CO₂ emissions, the world stands a far greater chance of reducing the threat of global climate change. If we do not, it's difficult to see how China will do it all alone. This is a choice that two great nations – who contribute by far the largest CO₂ emissions to the atmosphere – have to make. I hope this committee recognizes the extraordinary benefits that can come from cooperation between the United States and China in the area of mitigation of CO₂ emissions and the serious threats to our future if the two countries fail to find and pursue a common purpose in this arena