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Chairman Kerry and distinguished Members of the Committee, I am delighted to have the opportunity to discuss China's efforts to address climate change and the prospects for U.S.-China cooperation on this critical issue.

I. Introduction

China's climate policy is driven by the belief, widely shared within the government elite, that a lower carbon economy will be good for economic modernization, that there is money to be made through the development and sale of climate-related technologies, and that domestic energy security depends in part on expanding the role of renewable energy resources at home. When useful, China's leaders also link climate change mitigation to domestic environmental concerns such as air quality and flood prevention.

Many in China also appreciate the serious challenges the country will face if the global climate is not stabilized: an estimated 37% decline in agricultural output of three of the country's four major grains by 2050; rising sea levels that threaten hundreds of millions along China's wealthy coastal region; and increasing desertification that already plagues more than 20% of the country. In interviews, farmers in rural China will often attribute their poor land quality and growing water scarcity to climate change. Nonetheless, few within China's elite discuss climate change with a sense of urgency; the priorities remain continued rapid economic growth and social stability. To the extent that these priorities coincide with addressing climate change, China's leaders are enthusiastic about moving forward to address this global challenge.

Within these parameters, the range of initiatives that China has undertaken to mitigate its contribution to global climate change is vast. In fact, the number of actors in China now engaged in climate-related activities has exploded over the past several years. Beijing issues top-down targets for energy efficiency and provides subsidies for research and development on climate-related technologies, while local officials in China become climate entrepreneurs, actively

seeking partnerships with cities abroad or bidding for their cities or provinces to become experimental low-carbon zones. Some of China's best know companies, such as Haier, Lenovo and Baoshan Iron and Steel have also begun to publicize their efforts to reduce their carbon footprint. One voice still largely missing in China's climate discussions, however, is that of Chinese environmental NGOs, who, with a few exceptions, remain focused exclusively on domestic environmental concerns.

II. The Landscape of China's Climate Initiatives[1]

Many of China's Greenhouse Gas (GHG) reduction efforts have been highly publicized and are well-known. These efforts include: reducing energy intensity (energy consumption per unit of GDP) by 20% during 2006-2010; increasing the role of renewable energy within the primary energy mix to 10% by 2010 and 15% by 2020; a top 1000 program to improve the energy efficiency of the top 1000 energy consuming enterprises in nine sectors (iron and steel, non-ferrous metal, chemicals, petroleum/petrochemicals, construction material, textiles, paper, coal mining and power generation); a fuel consumption tax on gasoline of 1 rmb per litre;[2] replacing and adding to the country's stock of coal-fired power plants with more efficient models; and a massive afforestation program that has raised the level of forest coverage in the country from approximately 12% in 1998 to 18% in 2009.

New targets and policy initiatives are also announced with striking frequency. For example, the government has discussed more than tripling its wind-power generating capacity to 100 GW by 2020 from its previous target of 30GW; floated a proposal for a 40% Renewable Electricity Standard by 2050; pushed forward new rules on compulsory green procurement for local governments; and raised the possibility of a carbon tax and a carbon trading regime at some undisclosed time in the future.

China is also actively investing in new technologies that will help slow the rate of growth of the country's GHG contribution. It has announced a US$1.5 billion research subsidy for automakers to improve their electric vehicle technology. (China's leaders have called for 500,000 "new energy" vehicles, such as hybrids and electric vehicles, to be produced this year. Shenzhen is reportedly already establishing twenty 220-volt charging pillars in office and residential areas. According to one international consulting firm, Frost and Sullivan, it will take a minimum of ten

[1] The number of climate-related initiatives underway in China—as a result of central and local government, as well as international effort—is far too great to detail. This represents a sampling of some of the broadest and most highly publicized of China's GHG reduction efforts.

[2] Testimony of Barbara A. Finamore before the select committee on Energy Independence and Global Warming, United States House of Representatives (March 4, 2009)

years for China to transition to electric vehicles.) State-owned power developer China Huaneng Group has announced that it will pursue the development of technologies to capture and sequester carbon (CCS) with the assistance of the ADB and the Chinese government. [3] Shenhua Group is also pursuing CCS technology in conjunction with its planned coal-to-liquid fuels plant in Inner Mongolia. Moreover, power plant efficiency technology may soon also make its way from China to the United States. In April 2009, Xi'an Thermal Power Research Institute, a subsidiary of Huaneng, signed a preliminary agreement to supply Houston-based Future Fuels with a two-stage pulverized coal pressure gasification technology for an IGCC plant to be built in Schuylkill, PA in 2010.

China has also become the test bed for the rest of the world's GHG reduction efforts, technology development and transfer, and capacity building. Forty-two percent of the world's Clean Development Mechanism projects under the auspices of the Kyoto framework are in China. These projects have helped China expand its wind power capacity , develop coal bed methane capture projects, and provided a profit of several billion dollars for the Chinese government. (The windfall is slated for a green technology fund.) The international community is also actively pursuing eco-city or province partnerships (e.g. the European Union with Jilin, Chongqing and Guangdong, Singapore with Tianjin and California with Jiangsu). While these partnerships are not yet well defined, they all will likely embrace both capacity building for the Chinese government as well as the development of industries that will serve a low carbon economy (e.g. producing wind turbines). Certainly, the private sector, including multinationals and international NGOS are all deeply engaged in climate related activities in China: BP has a clean energy research center at Qinghua University in Beijing, Wal-Mart has launched a campaign to reduce significantly the energy used by its stores and factories; the Natural Resources Defense Council is working to promote energy-efficient buildings and demand-side management; and the Environmental Defense Fund has a pilot project to help reduce GHG emissions from the agricultural sector.

III. The Challenges Ahead

Despite the commitment of China's leaders and the rest of the world to move the country aggressively to a low carbon economy, however, the rate and nature of China's economic growth suggest that without significant new investment and international assistance, the country will fall

[3] "Green Hops: New Renewable Energy Targets, More Carbon Tax Chatter, Singapore-Nanjing Eco-city Announced," Green Leap Forward blog (May 8, 2009). http://greenleapforward.com/2009/05/08/green-hops-new-renewable-energy-targets

well short of what it needs to do to help stabilize the global climate. [4] Part of the challenge is related simply to the magnitude of the task at hand. Under a business as usual scenario, the International Energy Agency estimates that China's energy-related CO2 emissions will be twice that of the United States by 2030. If China succeeds in meeting its target of reducing its energy intensity by 20% by 2010, it will avoid emitting approximately 1.5 billion tons of CO2, the greatest contribution to GHG reduction currently underway in the world.[5] Yet despite this effort, China is on track to overwhelm the global effort to address climate change. In 2006, China added 90 GW of coal fired power capacity—enough to emit over 500 million tons of CO2 per year for 40 years[6]; by comparison, the European Union's entire Kyoto reduction commitment is 300 million tons of CO2.[7]

Beyond the sheer magnitude of the problem at hand, China's GHG reduction efforts are greatly complicated by emerging trends in the pattern of economic development, competing priorities within China's political system, and weak capacity for monitoring and enforcement. An effective climate program in China will need to address these issues.

Emerging trends in Economic Development

- *Urbanization*—China plans to urbanize 400 million people during 2000-2030. This will translate into significant growth in energy demand: urban residents use 3.5 times more energy than rural Chinese. China already is building 2 billion square meters of floor space each year, half the world's total. Lighting, heating and appliance use will all add to China's energy bill: despite efforts by retailers and by the Chinese government to promote the use of energy efficient appliances, one major retail chain reports that only 1-2% of the appliances they have sold over the past quarter qualify as energy efficient.

- *Transportation*—China's transportation sector is exploding. Its fuel economy standards (36mpg) are significantly higher than those in the United States (30mpg in 2010), but passenger car sales in 2008 were just shy of those in the United States: 6.76 million compared to 6.79 million; and this year China is on track to surpass the United States in

[4] The Tyndall center, for example, argues that China's energy portfolio will need to be 60% renewable by 2050 to stabilize the climate. The McKinsey report's baseline scenario for China's GHG emissions, in which China doubles its carbon emissions from 2005 by 2030, necessitates that China has 100GW of wind generating capacity by 2030. In its abatement scenario, however, in which China limits the growth of its carbon emissions to 10% above 2005 levels by 2030, McKinsey suggests that China would need 300GW of wind generating capacity.

[5] "Coal and Climate Change Facts," Pew Center on Global Climate Change. http://www.pewclimate.org/global-warming-basics/coalfacts.cfm

[6] Statement of Stephen Chu, Director, Lawrence Berkeley National Laboratory, before the U.S. Senate Committee on Finance (March 27, 2007).

[7] "Fact Sheet: China Emerging as New Leader in Clean Energy Policies," The China Sustainable Energy Program. http://www.efchina.org/FNewsroom.do?act=detail&newsTypeId=1&id=107

car sales.[8] In April alone, China sold 1.15 million cars. By 2020-2025, it is anticipated that China will have more cars on its roads than the United States.

- *Increasing population*—After decades of an aging and largely stable population, China may well experience some significant population growth. Children of one-child families who marry each other are permitted to have two children. Particularly in urban areas, where family planning has been strictly enforced, virtually all children twenty-seven years old and younger are only children. The potential for a population boomlet should be incorporated into future climate scenarios.

- *China Going Global*—China's going out strategy has encouraged thousands of Chinese enterprises to exploit natural resources in Africa, Latin America and Southeast Asia, often with devastating environmental consequences for the local environments. China's global logging practices are particularly relevant to climate change. Although China has a significant afforestation program at home, its companies often log indiscriminately abroad. China has become the largest importer of timber in the world, half of which is estimated to be illegally logged. A global sustainable forestry program should be part of China's portfolio of climate activities.

In Competing Priorities, the Economy Wins

- *China's "Green" Fiscal Stimulus Package*—China has received significant international acclaim for its "green" fiscal stimulus package. Both HSBC and the World Resources Institute claimed that slightly under 40% of the package is green (included in this was $98.65 billion for railroad construction; $70 billion for electric grid construction; $51.15 billion for water and wastewater treatment plants; and $1.5 billion for low-carbon vehicles). Yet as the Shanghai-based lawyer Charles McElwee has pointed out, "It is admirable that China is building more railroads and more grid infrastructure, but to suggest that with these investments China is engaging in a major shift of the focus of its economy to a sustainable one is far fetched. China is building more railroads to move more products. There is nothing in China's stimulus package that will prevent it from more than doubling its 2005 carbon emissions by 2030."[9] According to Vice-Minister Li Ganjie of China's Ministry of Environmental Protection, during the first quarter of 2009, only 10% of the 230 billion yuan (US$30 billion) of central government funds for the stimulus package targeted environmental protection, energy efficiency or emissions control.[10]

- *Economic Growth vs. Environmental Protection*—In the midst of the global economic slowdown, Chinese environment officials have expressed serious concern as to whether provincial and local governments are ignoring environmental standards. In the rush to launch investment projects, over 150 large-scale infrastructure projects have been subjected to a "green passage" process, which is a highly abbreviated environmental impact assessment process." In addition, provincial and local governments in a number of

[8] "US LDV Sales Down 35.5% in December, 18% for the Year," Green Car Congress (January 5, 2009). http://www.greencarcongress.com/2009/02/us-ldv-sales-fa.html

[9] "Fast & Loose," China Environmental Law blog (April 21, 2009). http://www.chinaenvironmentallaw.com/2009/04/21/fast-loose/

[10] Jing Fu, "Local Governments May Ignore Standards," China Daily (April 27, 2009).

regions have ignored the accountability system that links government officials performance to energy saving and emissions control to their careers." [11]

The Capacity Challenge

- *Compliance*—Compliance with environmental laws and regulations is a long-standing challenge in China. China's top environmental lawyer Wang Canfa estimates that only 10% of China's environmental regulations and laws are actually implemented. In 2006, for example, compliance with building energy efficiency standards was roughly 5%. A recent MIT study that surveyed 85 coal fired power plants discovered that although many plants installed state of the art desulfurization control technology, they did not appear to be operating the equipment. [12] Moreover, when companies are penalized for failing to comply with environmental laws or regulations, the central government reports that it collects only 30% of the fees. As the U.S. considers how best to assist China in moving aggressively to combat climate change, building in effective monitoring and compliance incentives and constraints will be essential.

- *Weak Overall Monitoring Capacity*—Although China has administrative measures for pollution monitoring in place, the guidelines provide no specific rules for monitoring or sanctions for failing to do so. According to Renmin University Professor Song Guojian, there are no documents detailing how many times per year a factory must be monitored. As a result, there is no assurance that a Chinese facility will remain in compliance on a sustained basis. Factories might well use their pollution control equipment or monitor their emissions only when there are inspectors present.[13]

- *Underdeveloped Climate Modeling Capacity*—Despite over fifteen years of experience in climate modeling in China, significant barriers to best modeling practices remain. According to one Chinese analyst, climate modeling is controlled by a few analysts who do not necessarily have the most expertise. The sensitivity of greenhouse gas emission-related issues also has undermined the integrity of some climate research projects. In October 2008, for example, the Chinese Academy of Sciences released a report projecting that China's national GHG emissions may more than double within the next two decades, but they failed to report the current level of emissions. There are also concerns that the global financial crisis will undermine funding for climate modeling in China from the West, which has been a significant source of support in the past.[14]

IV. How can the United States accelerate the positive trends in China?

Critical to the success of the international community in meeting the challenge of global climate change is helping China forge a new developmental path. As one European analyst has

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[11] Jing Fu, op. cit.

[12] Steinfeld, E.S., et al., Greener plants, grayer skies? A report from the front lines of China's Energy Sector," Energy Policy (2009)

[13] "An Assessment of Environmental Regulation of the Steel Industry in China," Alliance for American Manufacturing (March 2009), p. 32-33.

[14] Jianjun Tu, "Future Prospects of China's Policy on Climate Change," China Brief, Vol. 9, Iss. 1, (January 12, 2009).

noted, the United States and the rest of the world need China to do more than any other country in terms of deviating from business as usual.

This will not be cheap. McKinsey & Company estimates that to realize its abatement scenario for China (a 10% increase in carbon emissions in 2030 over 2005 levels) will require that China spend on average between US $195-260 billion annually in incremental capital investment over the next 20 years. Of these investments, McKinsey estimates that one-third will have positive economic returns, one-third will have a slight to moderate economic cost, and one-third of the technologies will have a substantial economic cost associated with them.[15]

It will also not be easy. U.S.-China cooperation on climate change will not be a panacea for all the other difficulties in the relationship, no matter how much we would like it to be so. Climate change is already laden with very challenging political and economic dynamics both within China and between China and the United States. Moreover, unlike China's WTO accession, which raised many similar issues of sovereignty, verification and compliance, intellectual property rights, and China's relative economic status, there is no-one in China that has yet stepped up to seize global climate change as his/her issue and to shepherd it through the bureaucracy in the manner of former Chinese Premier Zhu Rongji.

With that said, it is nonetheless imperative for the United States to step up to the plate. A number of organizations and experts have already weighed in with specific recommendations for high profile cooperative projects such as CCS joint research and development, smart grid technology and deployment, assisting in China's monitoring capacity, promoting building energy efficiency, etc.[16] All of these are critically important avenues for cooperation.

Equally important, however, is thinking through the political context of how best the United States can affect China's climate change path.

- *Lead by Example*—Although China will find its own path to a low carbon economy, the United States has the opportunity to demonstrate how it can be done, whether through best urban planning practices, the rapid development and spread of energy efficient building codes and new building materials, the development of alternative fuel vehicles and/or the rapid deployment of renewable energy and smart grid technology. The United States will have no credibility in pushing China to forge a new path if we, ourselves, are not already well down that road. Moreover, we will

[15] McKinsey & Company, "China's Green Revolution" (February 2009), p.10.

[16] These include "Common Challenge, Collaborative Response: A Roadmap for US-China Cooperation on Energy and Climate Change," Asia Society and Pew Center on Global Climate Change (January 2009); "Overcoming Obstacles to U.S.-China Cooperation on Climate Change," Brookings Institution (January 2009); and "Strengthening US-China Climate Change and Energy Engagement: Recommendations for Leaders and Policymakers in the US and China," Natural Resources Defense Council (February 2009).

lose a critical opportunity for our own environmental and economic future if we do not seize this moment to develop our own clean energy economy.

- *Help Transform China's Urbanization Process*—While most international attention has been focused on the role of heavy industry and the power generation sector in China's contribution to climate change, the urbanization of 400 million Chinese by 2030 will have a profound impact on China's energy use patterns. Energy efficient buildings (including new building materials) and appliances, electric cars, renewable, smart urban planning should be top priorities for U.S.-China collaboration. These partnerships, which may develop into eco-city or province/state partnerships should target first off China's national environmental model cities (about 10% of China's 660 cities) because the leaders and businesses in these cities have a proven track record of commitment to environmental protection in their cities. Similarly, companies that are members of China's Green Companies Program have begun to develop a track record of running their businesses in more efficient and environmentally sound ways. These should be the first candidates for joint projects.

- *Listen to the Chinese*—China knows what it needs and what it can deliver. Do the Chinese place a priority on assistance with their monitoring capacity for example? Understanding the priority issues for China will prevent the United States from squandering valuable financial and human capital trying to push against a closed door. For example, in a previous U.S.-China Strategic Economic Dialogue, the Chinese have stressed the importance of water scarcity, watershed management, etc. Helping China conserve and make more efficient use of its water is a critical aspect of climate adaptation, and will affect China's future agricultural opportunities as well as address growing concerns throughout South and Central Asia over China's river diversion efforts in the Qinghai Tibetan plateau as the glaciers in the region melt.

- *Build up from the Strategic Economic Dialogue*—The U.S. should avoid the temptation to think it must create an entirely new structure for cooperation with the Chinese on energy and environment issues. The SED has outlined many important climate-related issues and initiated some collaborative public/private projects, such as a partnership on electric cars and grid management. Cooperating with China is difficult and time consuming. The U.S. should take advantage of the foundation that has already been established.

- *Conduct an Off-the-Record "lessons-learned and where-to-from-here" Summit with U.S. NGOs and Businesses*—Many NGOs and multinationals have well over a decade of experience working with China on environmental and energy issues related to climate change. Their experience should be tapped to understand what works, what doesn't and why. They will also be the U.S. government's emissaries for much of the climate partnership work that is eventually established with China.

- *Coordinate with Japan and the European Union*—Japan and the European Union already have extensive cooperation with China on climate issues either underway or in development. The United States should not waste its time and energy duplicating or undermining others' efforts. We should develop at least loosely coordinated strategy to help move China much more aggressively to a low carbon economy. This coordination should extend to developing frameworks of assistance for other large developing country emitters such as India and Brazil.