

**China's Energy Consumption and
Opportunities for U.S.-China Cooperation to
Address the Effects of China's Energy Use**

Statement by

**Karen A. Harbert
Assistant Secretary
Office of Policy and International Affairs
United States Department of Energy**

Before

The US-China Economic and Security Review Commission

June 14, 2007

Madame Chairwoman, Mr. Vice Chairman and members of the Commission, I am pleased to appear before you today to provide the update on the Administration's engagement with China since our last testimony in February 2007.

CHINA'S ENERGY OUTLOOK

China continues to be the world's second largest energy consumer after the United States, and its impact on the global energy economy will likely remain strong in the coming decades.

According to the International Energy Outlook 2007, released in May, China consumed 40 percent less energy than the United States in 2004, but is expected to consume 11 percent more by 2030. Of China's energy use in 2030, 65 percent is projected to be provided by coal, 22 percent by oil, 6 percent by natural gas, 5 percent by renewables, and 2 percent by nuclear power.

In China, as well as in the United States, oil use is dominated by the transportation sector. In 2030, 47 percent of China's oil use will be for transport and 42 percent for industry.

Coal will remain the dominant fuel in China through 2030, with its use concentrated in the industrial and electric power sectors. Consequently, China will remain the world's largest producer and consumer of coal. In the electric power sector, China's use of coal is projected to grow at an average rate of 3.5 percent per year between 2004 and 2030.

Higher fossil fuel prices, energy security concerns, improved reactor designs, and environmental considerations are expected to improve the prospects for new nuclear power capacity in many parts of the world. In China, electricity generation from nuclear power is projected to grow at an average annual rate of 7.7 percent from 2004 to 2030. Of the 58 gigawatts of additional installed nuclear generating capacity projected in developing economies of Asia, 36 gigawatts is projected for China.

With heavy reliance on fossil fuel, China will continue to have a major impact on the global environment. By 2030, energy-related carbon dioxide emissions from China are projected to account for 26 percent of the world total. China will overtake the U.S. as the world's largest CO₂ emitter **before** 2010. China's carbon dioxide emissions are projected to exceed U.S. emissions by 4.6 percent in 2010 and by 41.4 percent in 2030. Coal-related emissions in particular are projected to grow by an average of 3.3 percent annually. By 2030, China is projected to account for 48 percent of the total coal-related emissions worldwide.

US ENGAGEMENT WITH CHINA IN ENERGY

DOE continues to engage China in energy policy, energy security, fossil energy, energy efficiency, renewable energy, and nuclear energy and nonproliferation. The primary mechanisms of engagement are the United States-China Energy Policy Dialogue (EPD), the United States-China Oil and Gas Industry Forum, the Protocol for Cooperation in the field of Fossil Energy Technology Development and Utilization, the Peaceful Uses of Nuclear Technologies Agreement (PUNT), and the United States-China Strategic Economic Dialogue (SED). Since the Commission held its hearings in February 2007, we have carried out cooperative activities under several of these mechanisms, most notably the SED and PUNT.

The second U.S.-China Strategic Economic Dialogue (SED) met in Washington, DC, on May 22-23, 2007. Energy and the environment continue to be important topics under the SED. Secretary of Energy Samuel Bodman led discussions on the urgency for investment in the energy sector, the importance of a diversified energy mix, and the power of scientific and technological innovation in addressing climate change issues. In the energy and environment session, chaired by Vice Premier Wu Yi, Secretary Bodman, together with EPA Administrator Stephen Johnson, Council on Environmental Quality Chairman James Connaughton, and Deputy Secretary of State John Negroponte had frank discussions on energy and environment issues with Chairman Ma from the National Development and Reform Commission (NDRC) and Minister Zhou from the State Environmental Protection Agency.

In the area of energy, the United States and China agreed to work together in a pragmatic manner to actively participate in the World Trade Organization multilateral negotiations on trade and environment, and engage in discussions on the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services. Also, the United States and China agreed to strengthen cooperation in advancing clean coal technology, aiming to develop up to 15 large-scale coal-mine methane capture projects in China, providing policy incentives to abolish cost barriers to full commercialization of advanced coal technologies, and advancing the research and development of carbon capture and storage technologies. Moreover, both countries signed a Memorandum of Cooperation on Nuclear Safety which paved the way for the Westinghouse AP1000 Nuclear Reactor project in China.

DOE and the NDRC also consulted on next steps to initiate the industrial energy efficiency assessments agreed to during the first SED meeting in December 2006.

Another major cooperative engagement was carried out under the Agreement on Cooperation Concerning Peaceful Uses of Nuclear Technology (PUNT). The PUNT Agreement was signed in 1998 by DOE and the State Development Planning Commission of China (now the National Development and Reform Commission) and provides a framework for long-term cooperation. The PUNT Agreement aims to advance a non-proliferation agenda with China that includes control of exports of nuclear materials, equipment and technologies; nuclear material control and accounting; physical protection of nuclear materials and nuclear facilities; nuclear reactor power plant safety, and nuclear safeguards technology development. Since 2002, the United States and China have had four Joint Coordinating Committee (JCC) meetings. The fourth JCC met in Washington, on May 10-11, 2007. The two sides established a new working group that focuses on nuclear emergency management; a new sub-group on radiological source security in the nuclear security, emergency management and safety working group; and the inclusion of export control technical cooperation to jointly develop Chinese language nuclear commodity guides to aid in China's export licensing and enforcement. The PUNT JCC meetings continue to enhance the mutual cooperation and understanding on nuclear nonproliferation assurance.

The above-mentioned mechanisms have complemented the Administration's on-going efforts to advance key energy security initiatives with China. These relate to energy efficiency, carbon sequestration, virtually emissions-free fossil-fueled power production, second-generation biofuels from non-food feedstocks, nuclear power, and strategic oil stockpiles. I will offer a brief description of each of these initiatives.

Fossil Energy

The Department has intensified its efforts to engage China in the FutureGen Initiative, which is a multilateral project to build a near-zero atmospheric emissions coal-fired power plant. In December 2006, China formally expressed its willingness to join the U.S. and other international partners on the FutureGen Government Steering Committee. The Department is currently leading negotiations among interested countries to conclude a multilateral international agreement so that the Government Steering Committee may launch a series of collaborative activities towards the FutureGen goal. On April 30-May 2, 2007, policy and technical experts from DOE met with counterparts from China, India, Japan and South Korea to review the proposed text of the international agreement. The countries plan to meet again in July to carry out further negotiations on the agreement. The final site selection will likely occur towards the end of FY 2007 or the beginning of FY 2008.

Energy Efficiency and Renewable Energy

As a means of reducing its strong demand for imported oil, the use of biofuels and, particularly, the production of ethanol from cellulosic feedstock have been of a particular interest to China, which is sensitive to balancing energy security and food security. In recent months, China's NDRC and Ministry of Science and Technology (MOST) have been strongly interested in exploring R&D cooperation with the United States in the area of biofuels, especially the production of ethanol from cellulosic feedstock.

Following the successful renewal of the Energy Efficiency and Renewable Energy Agreement in December 2006, DOE has been discussing with the NDRC potential cooperation in the area of biofuels research and development. Subsequently, the Secretary invited policy and technical experts from the NDRC to visit the National Renewable Energy Laboratory (NREL), in Golden, CO. On April 25, 2007, DOE, NREL and NDRC officials held in-depth discussions at NREL on the future of bio-energy, and explored possible cooperation on developing a biofuels roadmap for China, based on the approach that was used for developing the U.S. roadmap. Cooperation in biofuels roadmapping for China could potentially include the following major activities: roadmap design, coordination, and integrated analysis; resource assessment; technology and systems assessment; life cycle and sustainability assessment; market and policy assessment; and commercial partnerships.

Other renewable energies including wind, solar, and biomass also hold promise. U.S. firms with technologies in these areas stand to benefit from broader engagement with China. The elimination of tariffs and non-tariff barriers for clean energy technologies is a key element to expanding China's use of renewable energy sources.

The Department also supported the construction of Agenda 21 Building. Completed in 2004 through a cooperative effort between the Department and China's Ministry of Science and Technology, this green building has obtained a Leadership in Energy and Environmental Design Gold rating and demonstrated the potential contribution to energy conservation these technologies could make to our countries.

Nuclear Energy

China continues to pursue the development of its civilian nuclear energy program. The current plan calls for adding 40 GWe by 2020. The U.S. Government continues to advocate U.S. industry's efforts to market its nuclear power equipment and services in China. Westinghouse is nearing completion of a commercial contract to build four AP1000 nuclear reactors in China. This could potentially create new jobs in the U.S. and improve the trade balance between the U.S. and China. The Department, along with the State Department, has worked closely with U.S. industry to ensure that they meet the legal and regulatory requirements for this important contract. We encourage China's efforts to responsibly increase the share of clean energy sources, such as nuclear energy, in its energy mix.

Additionally, DOE continues to promote the Global Nuclear Energy Partnership (GNEP) initiative. The goal of GNEP is the expansion of nuclear energy for peaceful purposes worldwide in a manner that supports reliable electricity production without air pollution or greenhouse gases, while reducing the risk of nuclear proliferation. China's participation in GNEP demonstrates its commitment to pursuing the development of civilian nuclear program in a technologically safe and economically viable manner. On May 21, 2007, Secretary Bodman hosted the GNEP Ministerial meeting in Washington, DC, and met with representatives from China, France, Japan and Russia. The United Kingdom and the International Atomic Energy Agency also participated as observers to the ministerial. China was represented by Minister Ma Kai, Chairman of the National Development and Reform Commission. The representatives discussed GNEP's path forward toward increasing the use of safe, reliable and affordable nuclear power worldwide in a more proliferation-resistant manner. The topics discussed included infrastructure development needs for countries considering nuclear power; development of advanced fuel cycle and safeguards technology; establishment of reliable fuel services; spent fuel management; and building the partnership and next steps to pursue this major global initiative. While China's State Council, which is equivalent to our Cabinet, has not yet determined whether or not to participate in GNEP, DOE's Chinese counterparts have been supportive of the GNEP initiative.

Energy Security and Strategic Oil Stockpiles

In 2004, China identified four sites for its national petroleum reserves tanks and began building its strategic petroleum reserve (SPR)—in three phases, to be completed by 2020. The first phase, to be completed by 2008, will hold 100 million barrels- equivalent to 25 days of China's net oil imports. The second phase is planned to add 200 million barrels, covering 42 days of net oil imports. The completion of the third phase may increase the net storage capacity to 500 million barrels after 2010. The high oil prices of recent years prompted China to delay oil purchases to fill its strategic reserve until summer 2006. Only one of the four sites in Phase I, consisting of 52 storage tanks- a total capacity of 33 million barrels- has been filled. In addition to the national SPR, the government will reportedly require major state-owned oil companies to hold government-mandated oil stocks.

According to the Chinese official publications, the Chinese SPR will be managed by the newly established State Oil Stockpiling Office and the State Oil Stockpiling Center under the NDRC. The nature and structure of these organizations remain unclear. Also, several reports indicate that nearly half of the oil at the 52-tank SPR site has been leased to Sinopec. China does not have legislation to

govern its SPR. The government has indicated that the SPR regulations will be part of a comprehensive Energy Law, which is being drafted. China plans to complete the draft law by the end of 2007.

At a Five-Country Energy Ministers Meeting in Beijing, in December 2006, the Chinese leadership expressed its intention to use strategic stocks only during physical supply disruptions, not as a market management tool. China has also hinted at its intent to build reserves to equal 90 days of imports. As a consequence of these indications, we have been urging China to make a public commitment to international coordination of a SPR drawdown in the case of a severe supply disruption.

In December 2006, the Secretary invited NDRC Chairman Ma Kai to visit the U.S.'s SPR facility before the SED II. In response, an NDRC delegation visited the U.S. SPR facility in Bryan Mound, TX, on April 27. The Chinese delegation, led by Energy Bureau Deputy Director-General Xu Yongsheng, included the head of the State Oil Stockpiling Office and officials from China National Petroleum Corporation and Sinopec—two state-owned oil/gas companies that have been put in charge of constructing China's SPR sites. DOE provided briefings on operational principles as well as technical issues associated with our SPR.

The Asia-Pacific Economic Cooperation (APEC) has developed a set of best practices for oil stockpiling, and the U.S. hosted an APEC workshop on the implementation of these best practices in 2005, which China attended. At the second DOE-NDRC China Energy Policy Dialogue in September 2006, I strongly urged China's energy policymakers, including NDRC Vice Chairman Chen Deming, to use its SPR in accordance with International Energy Agency principles. In January 2007, DOE sponsored the International Petroleum Stockpiling Symposium in New Orleans, drawing over 100 participants, including 50 from overseas. At the conference, an official from the NDRC's Energy Bureau made a presentation on the status of the Chinese program. His five-person delegation asked numerous questions on the management of the U.S. SPR and the use of contractors. DOE proactively shared information on our facility management and oil acquisition approach, with a strong emphasis on the need for sensitivity to the market. Also, in October 2006, the IEA conducted a workshop on strategic reserves in Beijing, with active Chinese participation.

In our bilateral discussions, we have sought to persuade China that reliance on the deep and liquid international market for petroleum—backed by robust strategic reserves as a hedge against possible disruptions—provides the surest route to energy security. We have encouraged Chinese officials to forgo energy investments in problematic countries, such as Iran.

Climate Change

While a party to the UN Framework Convention on Climate Change and its Kyoto Protocol, China has no obligations under Kyoto to reduce greenhouse gas emissions, and it has shown no interest in adopting binding emissions targets. China's view is that industrialized countries, which are responsible for most of historical greenhouse gas emissions, should take the lead in reducing these emissions under the UN Framework Convention on Climate Change principle of "common but differentiated responsibilities." The priority for China remains sustainable development. It also

places a great deal of emphasis on energy security, adaptation and technology cooperation and transfer.

In early June, China unveiled the National Climate Change Program, as part of China's obligations under the United Nations Framework Convention on Climate Change. Under the plan, China will use hydropower, nuclear energy, and biomass fuels and gas to help cut 950 million metric tons (CO₂ equivalent) per year of greenhouse gas emissions by 2010. Specifically, China expects development of hydropower resources to cut the emissions by 500 million tons by 2010, nuclear energy development to account for 50 million tons of reduction, biomass energy to help reduce emissions by 30 million tons, and other renewable power generation (solar, wind, geothermal, and tidal energy) to reduce emissions by 60 million tons. Additionally, China expects more efficient thermal electricity production and transmission to reduce emissions by 110 million tons, and the re-use of coal-bed and coal-mine methane for electric power generation to lower them by 200 million tons.

The Administration is encouraged by China's strong drive to diversify the types of energy resources it uses. Also, China, like the United States, recognizes the pivotal role science and technology can play in addressing climate change concerns. Against this background, the Administration is successfully carrying out strong outreach to China to join such initiatives as the FutureGen project and the Global Nuclear Energy Partnership that would have a significant beneficial impact on the global energy economy and environment. We also encourage China's active participation in such existing fora as the Asia-Pacific Partnership on Clean Development and Climate, the Carbon Sequestration Leadership Forum, the Generation IV International Forum, the Methane-to-Markets initiative, and the International Partnership on Hydrogen Economy.

Conclusion

As two major energy consumers and economies in the world, the United States and China have been cooperating to address energy security and climate change issues, through both bilateral and multilateral mechanisms. Over the course of recent years, the two countries have come to recognize how interdependent our economic prosperities and energy security have become. We are committed to continue engaging China actively on a wide range of energy issues.

Thank you and I will be happy to take your questions.