

Statement of
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U.S.-China Economic and Security Review Commission

“China and the Clean Energy Opportunity”

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Commissioner Shea, Commissioner Reinsch, and members of the Commission, thank you for the opportunity to testify today.

Last fall, I was in a car on the eight-lane highway between Beijing and Tianjin, going around 60 miles per hour, when the bullet train came by going over 200 miles per hour. The sight was unforgettable. One instant the train was at our side; moments later it was gone. And it occurred to me – there’s a metaphor here. The United States is investing heavily in clean energy. We’re getting up speed and making real progress. But unless we take it up a notch, there’s every chance that China and others around the world will shoot right past us in the years ahead.

China is investing heavily in clean energy. In China today, some of the world’s largest wind farms deliver power to cities over ultra-high-voltage long-distance transmission lines using advanced technologies. Two of three solar water heaters in the world are located in the China and the government has recently instituted generous new incentives for solar power. Vehicle fuel-economy standards are higher than even our recently strengthened CAFE rules. China is investing in electric vehicle production capacity and infrastructure, shutting down inefficient small coal plants and building a vast rail network for moving people and goods.

What is driving this trend? In part, three overarching, economy-wide policies are playing a role in shaping China’s clean energy infrastructure:

1. A **clean energy standard** mandating that 15 percent of China’s primary energy come from non-fossil sources by 2020. China currently gets around 9 percent of its energy from these sources.
2. An **efficiency target** mandating that energy intensity (energy use per unit GDP) fall to 20 percent below 2005 levels by the end of 2010. China had reduced energy intensity by around 13 percent in July 2009.
3. A **carbon target** mandating a reduction in carbon intensity (greenhouse gas emissions per unit GDP) of 40 to 45 percent below 2005 levels by 2020.

These economy-wide policies are reinforced by an array of sector- and technology-specific policies, targets and incentives:

- **Wind.** After doubling capacity from 6 GW to 12 GW in 2008, China installed more than 9 GW in 2009, exceeding its earlier 20 GW target more than 10 years early and overtaking Spain to become the world's third-largest installer of wind power. Its 2020 target now stands at 30 GW and may soon be raised to 100 GW. This boom has been driven in part by a feed-in tariff: some utilities in China pay a preferential fixed rate for wind-generated power that is higher than rates for coal-generated power. Still, some reports note that up to a third of wind capacity is not connected to the grid. However, last year, China modified its renewable energy law to require grid operators to purchase all renewable power produced by generators, to develop transmission capacity and to invest in smart grid technologies.
- **Solar.** With around 40 percent of the global market, China is the world's largest supplier of solar photovoltaic (PV) panels. After years of booming demand from European countries, recent cuts in solar feed-in tariffs in Spain and Germany have led China to institute policies to quickly grow its small domestic market, including moving forward its 2020 solar target of 1.8 GW to 2011. The central government has proposed a feed-in tariff for solar, and announced it will pay for up to 70 percent of the cost of solar PV projects selected by provincial governments. (Interestingly, the Chinese domestic market for solar thermal water heaters is already quite large: 10 percent of Chinese households use solar water heaters, with 30 percent targeted by 2020.)
- **Transmission.** China plans to install 4,000 miles of advanced ultra-high voltage (UHV) lines, doubling its network of these advanced lines that lose up to 30 percent less energy in transit than lower-voltage lines. State Grid, the largest utility in China, will invest \$44 billion through 2012 and \$88 billion through 2020 in UHV transmission.
- **Vehicles.** China has fuel-economy standards that translate to around 36.7 miles per gallon and is considering regulations to raise them to 42.2 miles per gallon by 2015. China plans to have 60,000 new energy vehicles on its roads and manufacturing capacity to produce 500,000 vehicles annually by 2012. And the 2008 Chinese stimulus package included \$3 billion in funding for electric vehicle pilot projects in 13 cities, offering rebates to municipal governments and taxi fleets.
- **Transit.** China plans to spend more than \$1 trillion to expand its railway system from 49,000 miles today to 75,000 miles by 2020 (of which 8,000 miles will be high-speed rail). The world's fastest train service, averaging 194 miles per hour between Wuhan and Guangzhou, opened in December 2009.

- **Nuclear.** China only opened its first nuclear power plant in 1991, but has added 10 plants since then. It now generates around 2 percent of its electricity from nuclear, and has targeted 5 percent by 2020. This is still much less than nuclear share in the United States today (around 20 percent), but China's nuclear capacity is growing rapidly. China has 11 operational reactors, with 21 new reactors currently under construction (four of which are Westinghouse AP1000 reactors), and several additional reactors scheduled to be built or be under construction by 2020. According to the International Energy Agency, China will account for 57 percent of all new nuclear power plant construction globally between 2007 and 2020.
- **Coal.** China is the world's largest producer and consumer of coal. To improve efficiency and safety, China has shut more than 55 GW of small coal plants since 2006, exceeding its 2010 target years early. All new coal plants in China must use state-of-the-art technology, meaning that today the average efficiency of the coal fleet in China is better than the U.S. average. Several of China's coal companies are conducting carbon capture and storage (CCS) demonstrations that will sequester tens of thousands of tons of carbon dioxide (CO₂) underground each year. But Chinese coal use remains one of the largest and growing sources of carbon pollution: in 2008, Chinese coal consumption *alone* accounted for more than 17 percent of all energy-related CO₂ emissions globally.

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Here at home, we are also making unprecedented investments in our own transition to a clean energy economy. The American Recovery and Reinvestment Act included more than \$80 billion for clean energy – the largest one-time energy investment in U.S. history. At the Department of Energy, we have the responsibility for investing roughly half of this total, helping to speed economic recovery while creating or saving hundreds of thousands of jobs. With this historic down payment we aim to:

1. Save Americans billions of dollars by dramatically improving the energy efficiency of our homes and appliances;
2. Build the strongest renewable energy industry in the world, with investments that will *double* both non-hydro renewable energy generation and advanced energy manufacturing by 2012;
3. Transform our transportation sector by funding the first-ever electric vehicle plants in the United States, deploy alternative vehicles and develop advanced biofuels;
4. Facilitate a modern power infrastructure including deployment of 18 million smart meters;
5. Demonstrate that CCS can be economical in eight to 10 years, with grants, fund research into revolutionary new capture processes; and

6. Maintain U.S. leadership in science and technology through, for example our innovative new Advanced Research Projects Agency – Energy (ARPA-E).

Yet the Recovery Act is just that: a down payment. It alone is not sufficient to drive the kinds of investment we'll need to reach our long-term goals. To transition into a clean energy economy, we must create the appropriate incentives that make clean energy the profitable kind of energy. That means putting a price on carbon pollution through comprehensive energy and climate legislation. With such legislation, we'll establish clear targets and stable rules that will allow American industry to confidently scale up clean energy infrastructure and remain competitive in the global marketplace.

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China and the United States are the world's top energy producers, top energy consumers and leading greenhouse gas emitters. They're also the world's largest markets for clean energy technologies. This means that as the world transitions to clean energy, the United States and China are uniquely positioned to make a real difference.

This transition to clean energy is not a zero-sum game. We can leverage each other's comparative advantages and bolster our energy security by becoming more energy-efficient and developing new sources of energy. Working together, we can do more than acting alone.

Low-carbon development in China represents an enormous opportunity for American businesses. As it strives to develop cleanly, China will be a huge and growing market for clean energy technologies. In many cases, cooperation will increase Chinese demand for U.S. products.

So we have spent the last year working with our Chinese counterparts on a broad set of clean energy initiatives that were announced by President Obama and President Hu Jintao at their Summit last November in Beijing.

- **A U.S.-China Clean Energy Research Center (CERC)**, a \$150 million initiative to facilitate joint research and development of clean energy technologies by teams of U.S. and Chinese scientists and engineers. Initial research will focus on three critical areas: building energy efficiency, clean coal including carbon capture and storage, and clean vehicles. The United States and China have complementary strengths in these areas, so each country will benefit from collaborative research.

Last week, Secretary Chu announced the availability of \$37.5 million in U.S. government funding over the next five years for the CERC, to be matched by grantees for a total of \$75 million in U.S. research, in addition to an equal amount of \$75 million in Chinese funding. U.S. government funds will be used exclusively to support work conducted by U.S. institutions and individuals only, and Chinese funds will support work conducted by Chinese institutions and

researchers. The Department of Energy will provide one award for each of the CERC's three initial focus areas. Consortia of universities, national laboratories, private companies and other entities are encouraged to apply through Grants.gov. We will make selections this summer.

- A **U.S.-China Electric Vehicles Initiative**, encompassing work on joint standards development and joint demonstration projects. As part of this initiative, we're planning a workshop on electric vehicle codes and standards with Chinese experts this spring.
- A **U.S.-China Renewable Energy Partnership** and a **U.S.-China Energy Efficiency Action Plan**, including both cooperative technical and analytical work to speed deployment of renewable energy, modernize our electric grids, and improve the efficiency of our buildings, industry and consumer appliances. We are planning the first U.S.-China Energy Efficiency and Renewable Energy Forums, which will bring together U.S. and Chinese companies and could help increase Chinese demand for U.S. clean energy products and services.
- Through the **U.S.-China Shale Gas Partnership**, the United States and China could leverage U.S. experience in developing shale gas to promote cleaner fuels and open up markets for U.S. shale gas technologies. The U.S. Geological Survey (USGS) may conduct an assessment of China's shale gas resources, and the U.S. Trade and Development Agency (USTDA) may conduct a study of the production and investment potential of these resources. The Minerals Management Service (MMS) may conduct training on incentives that proved successful in developing the U.S. shale gas industry. And the Department of Commerce may host a public-private event to discuss the business environment needed to encourage such development. Later this month, DOE, in cooperation with USTDA and the Chinese government, is planning a training program that will include discussions on water management and advanced hydraulic fracture design.
- The **U.S.-China Energy Cooperation Program**, an industry-driven initiative, is leveraging private-sector resources for commercially viable project development work on clean energy and energy efficiency in both the United States and China. Activities include a Clean Energy Exchange Program which will introduce Chinese energy sector officials and project sponsors to U.S. clean energy technologies through a series of visits, and will cover topics such as green building and green cement production.

At the Department of Energy, we've created a new Office of East Asian Affairs and are hiring five new full-time staff to focus on the implementation of these initiatives. I am pleased to announce today that Secretary Chu will travel to China at the end of May to advance our overall objectives for clean energy cooperation.

Our work on these topics will be strengthened by passage of comprehensive climate and energy legislation. Such legislation will unleash American ingenuity, growing our economy and creating jobs while providing an example to the world.

The world is on the cusp of a clean energy revolution. China is moving forward with clear policies and smart incentives. Whether the United States is a leader or laggard in this revolution depends on the decisions we as a nation make in the months and years ahead.

This concludes my testimony. I appreciate the opportunity to participate in this hearing, and will be pleased to answer your questions.