

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

**Prepared Statement of  
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Madam Chairman, Mr. Vice Chairman, members of the Commission, I thank you for inviting me to appear before you today to speak on this topic. China's rapid emergence as a political and economic power with global ambitions is a pivotal element in East Asian security dynamics. China's efforts to secure access to critical resources and markets to propel its economic growth are a central part of that dynamic. My testimony this afternoon will offer some perspectives from the Department of Defense on the military, strategic, and geopolitical implications of China's energy acquisition strategy. These questions have an important influence on security trends in East Asia and more distant regions of the world. I commend the Commission for its continued interest in this topic.

**China's Economic Growth and Energy Needs**

In the three decades since Deng Xiaoping introduced "reform and opening," China has experienced rapid, continual economic growth and development. In 2006, China became the fourth largest economy in the world, surpassing Great Britain in gross national product. It is the world's third largest trading nation, with approximately \$974 billion in exports and approximately \$777 billion in imports in 2006. It is also a major destination for foreign direct investment. The engine of China's economic performance is its manufacturing base, where China has become one of the world's leading manufacturers.

To sustain the growth of China's economy, and to satisfy the rising expectations of a growing domestic middle class that naturally seeks the benefits of accumulated wealth, China's leaders are increasingly concerned over secure and reliable access to export markets and sources for raw material imports. Energy sources factor prominently in these calculations, as China's need for energy is projected to increase 89 percent by 2020.

According to the Department of Energy, China has become the world's second largest energy consumer after the United States. The Energy Information Administration projects that by 2025 (assuming current trends) China's demand for energy will surpass that of the United States, accounting for some 20 percent of total world demand.

Although China is expected to continue to rely on coal as its primary fuel source, consumption of petroleum and other liquid fuels is expected to grow significantly due, in large part, to expansion in the transportation sector. For example, automobile ownership in China is expected to rise from 27 million cars in 2004 to nearly 400 million cars by 2030. Nuclear power and natural gas account for growing, but smaller portions of energy consumption.

China currently consumes approximately 6.4 million barrels of oil per day, and since 2003, has been the world's third largest importer of oil and second largest consumer, after the United States. China currently imports about 40 percent of its oil (2.5 million barrels per day in 2005). According to the U.S. Department of Energy, China is expected to rely on imports to satisfy 69 percent of its oil demand by 2030 – importing approximately 11 million barrels per day to support consumption of approximately 16 million barrels per day.

As we in the Department of Defense have noted in our most recent report to Congress on Military Power of the People's Republic of China, concerns over access to resources, including energy, have become an important influence on China's strategic behavior. Compounding these concerns are the inherent frictions at the center of China's transformation to a "socialist market economy," in which dynamic elements of China's increasingly market-based economy clash with the Chinese Communist Party's desire to retain its monopoly on political power and control of strategic industries and sectors of the economy, including energy.

China's leadership appears concerned that the rapid growth of China's oil and gas consumption and the related need to insulate China from fluctuations in global market prices could affect economic growth and domestic stability. Premier Wen Jiabao stated that, "[the] shortage of oil and gas resources has become a restricting factor in our country's economic and social development." A no less urgent concern for Beijing is the secure transport of these materials back to China. At present, China can neither protect its foreign energy supplies nor the routes on which they travel, including the Strait of Malacca through which some 80 percent of China's crude oil imports transit. In November 2003, China's President and Chinese Communist Party General Secretary Hu Jintao discussed this vulnerability, the so-called "Malacca Dilemma," presumably because it poses fundamental questions over whether China should maintain its present reliance on others for sea lane security, develop its own capabilities to protect its own sea lanes (or work cooperatively with others toward these ends), or develop alternative sea-borne or overland supply routes.

### **China's Response to Energy Dependence**

Confronted with the challenges of rising energy demand, China's leaders have embarked on a sophisticated strategy designed to address China's energy security needs. This

strategy is being pursued along three principal axes: 1) increasing energy efficiency and use of renewable resources; 2) increasing domestic production and infrastructure development; and, 3) securing foreign resources. I will focus mainly on the latter because when China acts as if it can “lock-up” energy supplies in third countries, it raises concerns for U.S. defense and security policies.

Increasing Efficiency and Use of Renewable Resources. According to China’s National Development and Reform Commission (NDRC), in 2005, China’s energy efficiency was about 10 percent lower than that of mature market economies. Energy consumption per unit of product in key industries (e.g., electric power, iron and steel, non-ferrous metals, petrochemical, building material, chemical light industry, and textile industry) is about 40 percent higher than in advanced economies. Energy consumption for space heating per building area in China is some two to three times higher than that of developed countries with similar climates. Increased efficiency and use of renewable resources would narrow the gap in energy use between China and other countries, creating significant energy savings and reducing China’s overall energy demand.

Beginning with the 11<sup>th</sup> Five Year Plan (2006-2010), China’s leaders called for a 20 percent reduction in energy consumption per unit of Gross Domestic Product by 2010. To support this goal, China plans to invest in a variety of conservation projects, some of which were outlined in the NDRC’s 2005 “China Medium and Long-Term Energy Conservation Plan,” which included alternative fuel vehicles and high efficiency motors, energy conservation projects for commercial and residential buildings, and combined heat and power cogeneration. China has sought to improve fuel efficiency standards and has planned to increase investment in alternative fuels and renewable energy sources such as hydro-electric, wind, solar, and biomass. These are ambitious aims, the implementation of which will require significant investment and follow-through. To underscore this point, in his 2007 government work report, Premier Wen Jiabao acknowledged that China was failing to date in meeting these goals.

Increasing Domestic Production and Infrastructure Development. China’s largest oil field at Daqing provides for about 25 percent of China’s total crude oil production; however, production at Daqing peaked in the 1970s, and has declined steadily at an average annual rate of 2.6 percent since 1997. To compensate for this decline and as energy demand increases, China has sought to expand production at other fields in China, open up reserves in western China’s Xinjiang Province, increase off-shore production, and increase both on-shore and off-shore exploration. According to the Department of Energy, in 2004, China began building its strategic petroleum reserve (SPR)-in three phases, to be completed by 2020. The high oil prices of recent years prompted China to delay oil purchases to fill its strategic reserve until summer 2006. 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. After 2010, work on the third phase may increase the net storage capacity to 500 million barrels.

China is also investigating coal liquefaction to increase its use of coal as a direct substitute for oil. In general, however, the coal sector in China has suffered from poor and inadequate infrastructure and distribution bottlenecks leading to chronic localized power outages and the search for foreign sources of coal, despite the overwhelming abundance of this resource in China. Moreover, the environmental consequences of China's coal utilization are significant, with the country expected to surpass the U.S. as the number one source of carbon dioxide emissions this year, or the next. China plans to expand its use of nuclear power by building an additional 30 1,000 megawatt nuclear power reactors by 2020 (increasing nuclear power from 2 to 6 percent of total electricity output and prompting its search for foreign uranium supplies). It also looks to increase natural gas utilization from 3 percent to 8 percent of total consumption by 2010 and has launched a program to build the necessary infrastructure to ship domestic natural gas from deposits in western China to major demand centers along the coast.

Securing Foreign Resources. The third response from China to its growing energy needs, -- and energy security concerns -- is to diversify its energy supply through a "go out strategy" to secure new foreign imports and acquire overseas assets. As noted in the Department of Energy's February 2006 report to Congress pursuant to Section 1837 of the Energy Policy Act of 2005, as recently as 1996, China relied primarily on two countries, Oman and Indonesia, for roughly half of its imports -- 70 percent when including Yemen. Since that time, China has pursued long-term supply contracts with a diverse range of supplier nations to include Angola, Chad, Egypt, Indonesia, Kazakhstan, Nigeria, Oman, Russia, Saudi Arabia, Sudan, and Venezuela. Last year saw the largest annual increase in new energy contracts signed by China with new agreements with Saudi Arabia and several African countries. Currently, slightly over half of China's oil imports come from the Middle East and almost a quarter from Africa.

In addition to securing long-term supply contracts, China has pursued equity positions in a variety of energy assets and investments. Although small compared to investments by the international oil majors, China's investments have increased significantly in recent years. Chinese national oil companies have invested in oil ventures (oilfield development, and pipeline and refinery projects) in Kazakhstan, Nigeria, Sudan, and in over 20 other countries in North Africa, Central Asia, Southeast Asia, Latin America, and North America.

### **Security and Defense Implications**

China's response to its energy needs has led Beijing to finance energy projects that have uncertain prospects for a positive return on investment; ignore political risk that is prohibitive to private commerce; and, establish closer relations with "problem states,"

such as Sudan, that are rich in energy, but that defy international norms and pose risks to regional stability. The continuing growth in China's economy will drive increased Chinese reliance on fossil fuels and sea-borne supply lines for the foreseeable future, and will continue to shape China's security and defense policies in ways that will affect U.S. strategic interests.

Security Implications. China's affinity for long-term supply contracts and equity positions, and its attendant belief that it must establish special relationships with these foreign suppliers, has potential negative repercussions on regional stability. China has used economic aid, diplomatic favors, and the sale of military technologies as incentives to secure energy deals. China's energy needs have led Beijing to strengthen its commercial ties with Sudan, and have complicated efforts to secure more robust support from China in countering that country's defiance of international norms. They may have also influenced China's role in containing Iran's nuclear ambitions. In recent years, China has also offered economic assistance and military cooperation to countries located astride key maritime and overland transit routes.

A second implication lies in the uncertainty created by China's energy acquisition strategies. As documented in the reports published by this Commission, there remain concerns and questions both within the United States and among China's neighbors over the economic impacts of China's energy policies. Whereas the United States tends to pursue energy security through fostering broad-based markets and diversification of resources, China has tended to see its energy security interests advanced by protecting itself from the international market through control of the supply-chain beginning at the source of production. Some have questioned whether investments by Chinese national oil companies in energy assets such as oil and gas fields, pipelines, and refineries abroad will "remove" energy resources from the competitive market. On the contrary, ownership of these resources generally displaces what the Chinese would have otherwise bought on the open market, and the production from Chinese-owned firms often enters the market for global consumption. To the extent that Chinese firms are investing where other international firms are not, the behavior could even expand the world's supply of trade oil and gas. Nevertheless, the question remains over the degree to which China's behavior could affect other countries, including emerging market economies, potentially creating a trend that runs counter to the process of market-oriented economic globalization upon which China is increasingly dependent for success.

A third implication relates to lingering disputes that China has with several of its neighbors over sovereignty claims in the East and South China Seas. Disputes over ownership of rich energy deposits, including some 7 trillion cubic feet of natural gas and up to 100 billion barrels of oil, in the East China Sea have periodically contributed to friction between China and Japan. Japan maintains that the median line should determine sovereignty, while China claims an exclusive economic zone of 200 nautical miles from its continental shelf – extending almost to Japan's shore. We are encouraged that Beijing

and Tokyo remain focused on diplomacy to resolve this issue. Nevertheless, as we saw in the fall of 2005 when PRC naval vessels trained their weapons on Japanese Self Defense Forces aircraft monitoring Chinese drilling and survey activity in the disputed area, a clear potential exists for miscalculation or accidents that could lead to a crisis both sides would prefer to avoid.

In the South China Sea, China claims exclusive sovereignty over the Spratly and Paracel island groups – a claim shared either whole or in part by Brunei, the Philippines, Malaysia, Taiwan, and Vietnam. Although all parties continue to adhere to a 2002 Declaration of Conduct that commits each “to resolve their territorial and jurisdictional disputes by peaceful means” without “resorting to the threat or use of force,” competing sovereignty claims in this area have been the source of tension and conflict in the past. Energy shocks or the discovery of extractable resource deposits could lead to renewed frictions between China and one or more of the other parties to the dispute.

Defense Implications. As we have discussed in our 2007 report to Congress on Military Power of the People’s Republic of China, there is a question over the extent to which Beijing’s concerns for the security of its access to energy supplies has begun to shape China’s defense policy and force planning for the future. That energy and resource concerns influence China’s thinking about the problem of defense planning no longer appears to be subject to debate; China’s latest defense white paper, China’s National Defense in 2006, states explicitly in its description of the security environment that, “security issues related to energy, resources, finance, information and international shipping routes are mounting.” It also defines the People’s Liberation Army’s (PLA) primary task as the “upholding [of] national security and unity, and ensur[ing] the interests of national development.” China has not been forthcoming on how these concerns will be addressed through doctrinal evolution, resource allocations, force structure changes, or contingency planning, however. The lack of transparency and excessive secrecy that surrounds Chinese military and security affairs gives limited insight, if any, into the debates occurring within China on these fundamental questions.

We see today a PLA that is in the midst of a broad-based comprehensive military transformation designed to fight and win short-duration, high-intensity conflicts against high-tech adversaries. The near-term focus of China’s force development appears to be on preparing for military contingencies in the Taiwan Strait, including the possibility of U.S. intervention. Over the longer-term, our report observes that official documents and writings by Chinese military strategists suggest Beijing is surveying the landscape beyond Taiwan in the consideration of the application of China’s military forces to other regional contingencies, such as conflict over resources or territory. At present, China’s ability to project and sustain military power at a distance remains limited. This indicates that, at least for the near and mid-term, China, and in particular the PLA Navy, faces an ambition-capability gap in terms of using military power to secure its foreign energy investments or to defend critical sea lanes against disruption.

In analyzing the potential capabilities that China may consider developing for these types of missions, a number of current PLA acquisition programs are of note:

- New missile units outfitted with conventional theater-range missiles at various locations in China could be used for anti-access/area denial in a variety of regional contingencies.
- Airborne early warning and control and aerial-refueling programs could permit extended-range offensive air operations into the South China Sea.
- Advanced destroyers and submarines equipped for anti-air, anti-surface, and undersea warfare could enable Beijing to protect and advance its maritime interests.
- New equipment, better unit-level tactics, and greater coordination of joint operations are improving China's emergent expeditionary forces – at present, three airborne divisions, two amphibious infantry divisions, two marine brigades, about seven special operations groups, and one regimental-sized reconnaissance element in the Second Artillery.
- Investment in command, control communications, computers, surveillance intelligence and reconnaissance (C4ISR) capabilities, including space-based and over-the-horizon sensors, could improve identification, tracking, and targeting of foreign military activities deep into the western Pacific Ocean.
- Extended long-range patrolling into the Indian Ocean is providing increased opportunities for PLA Navy crews to become familiar with the traditional sea lanes upon which their oil is shipped. China has conducted two multi-ship forays into the Indian Ocean this year, including one to participate in a multilateral naval exercise hosted by Pakistan, and the other to call on St. Petersburg, Russia.

As we look to the future, a number of key trends and PLA capability developments are worth monitoring, in particular those related to extended-range power projection, including aircraft carrier development; expeditionary warfare; undersea warfare; anti-air warfare; long-range precision strike; maritime C4ISR; expeditionary logistics and possible forward basing; training and exercises, especially in open water; and, a more activist military presence abroad.

## **U.S. Government Engagement**

Energy efficiency and security is increasingly a focal point of U.S.-China relations. The number of bilateral and multilateral forums in which we engage China on energy

continues to expand. The list currently includes the Strategic Economic Dialogue; the Energy Policy Dialogue; the Asia-Pacific Partnership on Clean Development and Climate; the Senior Dialogue; the Five-Party (U.S., China, ROK, Japan, India) Energy Ministerial; the APEC Energy Working Group; and the Methane to Markets partnership. The President's recently announced climate change strategy targets China and other major emitters of greenhouse gases, with goals including collaboration on the broader use of clean, efficient energies in our markets.

## **Conclusions**

In summary, as China's economy grows, its demand for energy – and the secure, reliable access to energy sources, including oil, will continue to grow. China's energy acquisition strategy, based on an affinity for long-term supply contracts and equity positions in foreign ventures, and its attendant belief that it must establish special relationships with foreign suppliers, poses concerns for U.S. strategic interests. An immediate consequence of this behavior is the negative impact that it has on U.S. goals favoring the spread of democracy, as well as priorities for the promotion of human rights and the rule of law, confronting the threat of terrorism, and non-proliferation.

In the mid- and long-term, however, this behavior could pose the risk of spreading instability in volatile areas to neighboring countries with ramifications for regional security. Finally, there is a question over the degree to which increased PRC foreign energy investments might lead Beijing to develop the military capacity to protect those investments if instability threatens to put them at risk.

There is an important role for U.S. policy in helping to frame China's choices and to encourage China's leaders to make responsible decisions that strengthen and support global security and prosperity. In this regard, U.S. policy is integrating a discussion of global market dynamics into a broader discussion of China's national security priorities to help shape Beijing's views on economics and market principles. At the same time, we must also watch closely China's energy acquisition efforts in Africa, the Middle East, and the Western Hemisphere, as well as the effects of Beijing's "go out strategy" on the behaviors of other key states of concern. And within the Department of Defense, we must continue to monitor carefully China's military modernization and foreign military activities, particularly as they relate to capability developments that improve the PLA's power projection and anti-access/area denial forces.

Madam Chairman, Mr. Vice Chairman, and Members of the Commission, I thank you again for the opportunity to testify today and look forward to taking your questions.