



## **Energy in China Fact Sheet**

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China's energy picture is making international headlines. High global oil prices have been linked in part to China's rapid growth in consumption, due to faster-than-anticipated industrial growth and China's embrace of the private automobile. China's electricity demand outstrips supply in 24 provinces; coal consumption surpassed 2 billion tons last year—a third of the world's total and twice the level of the U.S.—and could grow another 15 percent this year. China is building a new 1,000-megawatt coal-fired power plant every week, consumes half the world's cement, a quarter of all steel, and two-fifths of all copper. Fluctuating energy prices worldwide have encouraged the government to diversify its energy sources, both in location of sources and types. Over the past two years nearly two-thirds of the country has suffered from brownouts in the summer months.

### **I. Challenges to Energy Development in China**

- Lack of transmission lines to reach consumers. The Chinese State Grid Corporation estimates that it will take \$10 billion per year to upgrade the transmission infrastructure (Staub 2005).
- The Chinese government is under-investing in expanding the capacity of administration to support energy efficiency and renewable energy (Ogden 2005).
- Lack of transparency in pricing and regulation throughout the energy supply chain encourages waste and prevents the development of new or efficient technologies. For example, the price of gas has risen to \$1.73 a gallon, obviously not reflecting the market prices (Bradsher 2005).
- Lack of central regulation over local jurisdictions in energy development.
- Tension between the need for market forces to play a greater role in resource allocation and the government's desire to protect state-owned enterprises.
- In East Asia, economic nationalism hinders transboundary networks, joint exploration, and production in disputed waters, market information, and emergency response mechanism (Andrews-Speed and Ma 2005).

### **II. Coal Energy in China**

Because of its high reserves in coal and relatively low-level of development and infrastructure in other fuel sources, China is expected to continue to favor coal as its top fuel source. Coal liquefaction and gasification industries are being promoted to counteract imports of oil and natural gas. The world's first commercial coal liquefaction plant in Inner Mongolia is scheduled to be operational by 2008. The percentage of the total industrial energy consumption of coal in China is expected to rise from 50 percent to 55 percent by 2025 (Mellish and Kearney 2005). This growth in coal consumption is due partially to steel and pig iron production. The use of coal in electricity production is expected to rise by 3.3 percent a year. Moreover, China continues to import increasing quantities of coking coal.

- Coal consumption is expected to be 45.1 quadrillion Btu by 2010, up from 27.9 quadrillion Btu in 2002 (IEO 2005).

- China's known coal reserves were 114,500 million metric tons at the end of 2004 (Walton 2005).
- China's coalmines are the most dangerous in the world officially being responsible for 6,000 deaths in 2004, 80 percent of the world's total (Aldhous 2005).
- Direct coal liquefaction in China is about 60% efficient (Aldhous 2005).

### III. Natural Gas in China

Currently natural gas only represents about 3 percent of China's total primary energy consumption. However, natural gas consumption is projected to rise about 7.8 percent a year until 2025 (Barden and Martin 2005). In the residential sector, consumption is expected to double by 2010, but the biggest growth is projected for the electric power sector.

- Natural gas consumption was 1.3 quadrillion Btu in 2002 and is predicted to rise to 3.1 quadrillion Btu by 2010 (IEO 2005).
- The completion of the West-East Pipeline in 2004 will ultimately provide much its natural gas to the residential sector in eastern China. The pipeline is not yet fully operational because electric power plants that it will supply are not yet finished (Barden and Martin 2005).

### IV. Oil Use and Consumption

China is the second-largest importer of crude with net imports of 117 million tons in 2004 (*Financial Express* 2005). China's domestic production is expected to decline to about 3.5 million barrels per day (IEO 2005) depleting its proven reserves in as few as 14 years. In an effort to prevent foreign dependency, the Chinese government has been looking for alternatives to oil, such as coal-to-liquids technology, and has encouraged its oil companies to buy oil fields all over the world. With increasing quality of machines and workers, China has been able to increase the production of relatively small wells that they buy. However, China has made very little effort to organize energy trade and cooperation in Northeast Asia despite the geographical proximity of Japan and Korea as fellow energy importers and Russia as a major energy exporter. This is probably due to mutual mistrust and lack of institutions to deal with those relationships (Andrews-Speed and Ma 2005).

- Oil consumption was 10.6 quadrillion Btu in 2002 and is expected to rise to 18.9 quadrillion Btu in 2010 (IEO 2005).
- As of 11 December 2006, foreign companies will be allowed to distribute wholesale imported crude and processed oil without the artificially low prices (Walton 2005).
- Together with the Philippines and Vietnam, China will conduct Seismic 2 and 3 dimensional South Sea investigations for oil over a 140,000-square kilometer range (*Asia Times* 2005).

#### China's National Oil Companies:

**China National Offshore Oil Corporation (CNOOC):** Started in 1982, its largest production area is Bohai Bay. Major partners include Chevron Corp., ConocoPhillips, and Devon Energy Corp. It is the first of the national oil companies to pursue liquefied natural gas (LNG) operations. (Walton 2005).

**China Petrochemical Corp. (Sinopec)** was started in 1983. In the late 1990s, Sinopec Group owned more than 90 percent of China's refining capacity. Sinopec group created Sinopec Corp. to become China's largest producer and distributor of oil products. It is mainly active in Africa (Kwong 2005).

**PetroChina:** Founded in 2000 Petrochina is the subsidiary company of **CNPC**, which was founded in 1988, it is the largest oil and gas producer in China. Last year its overseas production was 7.68 million barrels (Kwong 2005). This company is the owner of the West-East Pipeline. (Walton 2005).

## V. Nuclear Energy in China

Nuclear energy contributes the least to China's overall energy consumption. However, with pressure to reduce air pollution and increase energy supply reliance on nuclear energy is expected to rise from 0.2 quadrillion Btu in 2002 to 9.9 quadrillion Btu by 2025 (IEO 2005).

- China is expected to contribute 24 gigawatts of the projected 55 total from emerging Asian countries (IEO 2005).

## VI. Renewable Energy and Energy Efficiency

The Chinese government is working to improve energy efficiency and use of renewable energy as quickly as possible, in part by issuing efficiency codes for buildings, appliances and, vehicles. In Changchun, the government is working with Toyota to set up a fleet of hybrid taxis.

- Total consumption of renewable energy in China was 3.1 quadrillion Btu in 2002 and is expected to rise to 5.2 quadrillion Btu by 2010 (IEO 2005).
- The Shanghai government launched the Green Pricing Program to fund wind energy. Fifteen large companies agreed to use half of their electricity from a new wind farm and pay 6.5 cents per kilowatt-hour for it (*China Update and Clippings* 2005).
- The Renewable Energy Law passed by the National People's Congress in March 2005 calls for 10 percent of all China's energy to come from renewable sources by 2020 and for that quantity to be at least 120,000 megawatts (*China Update and Clippings* 2005).
- Electricity pricing policies are being adopted to make prices of energy more cost-reflective as of April 2005. These policies aim to encourage demand side management and more efficient use of electricity (*China Update and Clippings* 2005).
- China's 11<sup>th</sup> Five Year Plan targets the production of 42 gigawatts of additional hydroelectricity by 2010 (IEO 2005).
- Installed wind capacity is 567 MW in 2005, expected to rise to 20 GW by 2020 (NREL).

## VII. Useful Links

Beijing Energy Efficiency Center: [www.beonchina.org](http://www.beonchina.org)

Energy Information Administration: [www.eia.doe.gov](http://www.eia.doe.gov)

National Renewable Energy Laboratory: [www.nrel.gov](http://www.nrel.gov)

The Energy Group and Lawrence Berkeley National Laboratory: <http://china.lbl.gov>

Energy Foundation: [www.ef.org](http://www.ef.org)

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