

# ENERGY POLICY ACT 2005

## Section 1837: National Security Review of International Energy Requirements

Prepared by  
The U.S. Department of Energy

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*The following report was prepared by the U.S. Department of Energy in response to Section 1837 of the Energy Policy Act of 2005, entitled “National Security Review of International Energy Requirements.” Section 1837 requires that the U.S. Department of Energy, in consultation with the Department of Defense and the Department of Homeland Security, prepare a study of the growing energy requirements of the People's Republic of China and the implications of such growth on the interests of the United States. The following departments were consulted in the preparation of this report: The Department of Defense, The Department of Homeland Security, The Department of State, The Department of Treasury, and The Central Intelligence Agency. The complete text of Section 1837 is attached as Appendix C.*



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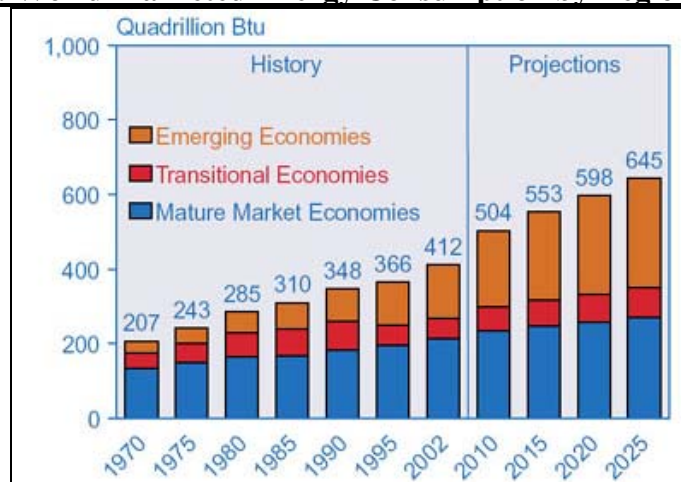
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## I. Introduction – Global Energy Markets

World energy consumption has grown dramatically over the past few decades – doubling in total volume between 1970 and 2002. According to the Energy Information Administration (EIA), energy consumption grew at an average of 2.2% per year during this period, with totals increasing from 207 quadrillion British thermal units (btu) in 1970 to 412 quadrillion btu in 2002. In the next 20 years, growth in energy consumption is expected to continue to increase, though at a rate slightly lower than previous decade (2.0% growth rate). Emerging economies, such as China, account for much of the projected growth, with energy demand growing at a rate of 3.2% and total energy consumption projected to more than double by 2025.<sup>1</sup> This growth in energy demand will be driven by large increases in both economic growth and world population coupled with rising living standards in these countries. In contrast, increases in energy consumption for the mature economies will be quite modest, with growth averaging 1.1% per year in the same period. However, little change is expected in the relative shares of the major fuel sources (Figure 1.2) with fossil fuels continuing to be the dominant energy source and renewables and nuclear playing smaller, but important, roles.

**Figure 1.1: World Marketed Energy Consumption by Region, 1970-2025**



Source: EIA International Energy Outlook 2005

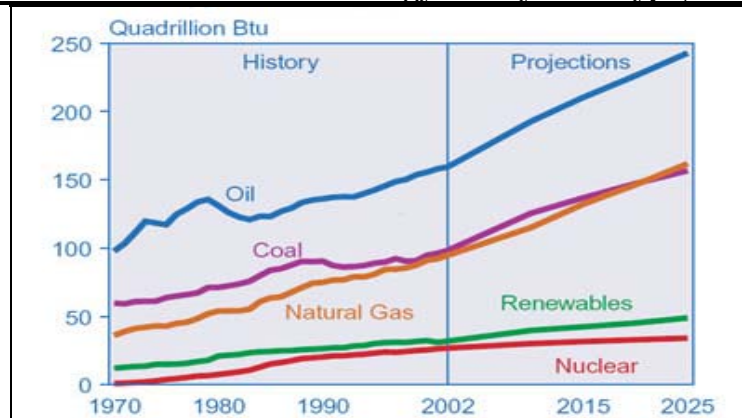
World oil consumption is of particular importance to global energy markets, as it will continue to be a dominant source of energy. Oil consumption has increased dramatically in the past few decades, nearly doubling between 1970 and 2002, and this trend is expected to continue, with growth projections of an increase in demand from 78 million barrels per day (b/d) in 2002 to 119 million b/d in 2025. This increase in oil demand will undoubtedly place an increasing strain on global supplies, requiring large increases in oil production (approximately 42 million b/d over the 2002 levels, according to EIA). Furthermore, oil supply sources have become increasingly concentrated in the hands of

<sup>1</sup> According to the EIA, emerging economies include those countries whose economies are currently less developed but whose energy use patterns, in general, are expected to begin resembling those of mature market economies over the next two years. These nations typically have energy-intensive industrial sectors and include such rapidly growing economies as China and India.

few exporters, primarily led by the members of the Organization of Petroleum Exporting Countries (OPEC). This concentration will likely continue in the coming decades, increasing the dependence on imports for many countries (such as China and the U.S.) with large energy requirements. OPEC members are expected to be the major suppliers of the increased oil demand, though substantial increases are also expected to come from the Caspian, Western Africa and Latin America. Increased concentration of exports, combined with limited global excess capacity will make all importing countries more vulnerable to price shocks and increase the overall sense of global energy insecurity.

Global consumption of natural gas and coal has risen significantly in recent decades as well, with the expectation that consumption will continue to increase steadily. Most of this increase is due to growth in the industrial sector and growth in electric power generation, particularly in rapidly growing economies.

**Figure 1.2: World Marketed Energy Use by Fuel Type, 1970-2025**



Source: EIA International Energy Outlook 2005

## II. China's Energy Outlook

Over two decades of market-oriented reforms in China have resulted in large increases in per capita incomes, significant poverty reduction, a substantial rise in non-state sector activity, and growing integration into the global economy. Since 1978, China's economy has grown about 9% a year, fueled by freeing market forces, opening to outside investment, and exports. In 2004, China's Gross Domestic Product (GDP) grew 9.1%.<sup>2</sup> China is now the world's seventh-largest economy, the world's third-largest trading nation, and a major destination for foreign-direct investment. To sustain that growth, China has had to become increasingly engaged with the rest of the world to secure inputs it needs, and markets for its surging exports. China is the world's second largest energy consumer after the United States, although per capita energy consumption is still only one-eighth that of the United States. China became a net importer of oil in 1993, after years of growth in consumption and stagnant production. As China has become more dependent on imported oil, it has sought to acquire interests in overseas exploration and production. Chinese oil companies have invested in Kazakhstan, Venezuela, Sudan, Iraq,

<sup>2</sup> CIA Factbook, China. Found at <http://www.cia.gov/cia/publications/factbook/geos/ch.html>.



Iran, Peru, and Azerbaijan. Upstream investments also include Sudan and Indonesia. Saudi Arabia accounted for 17% of oil imports in 2003, with the Middle East providing more than half of overall imports.

In the United States, and among China's neighbors, there is concern about the economic impact of China's energy policies. Attention has tended to focus on recent investments by Chinese oil companies in energy assets such as oil and gas fields and in foreign companies that own such assets. Companies based in many countries, not only China, seek to invest in oil and gas sectors around the world, by purchasing domestic energy firms and stakes in exploration and production activities, entering into joint venture operations, participating in tender processes, financing energy infrastructure projects, operating refineries, and marketing petroleum products.

Nonetheless, there is a concern that actions by Chinese companies to acquire energy assets will "remove" energy resources from the competitive market, which, according to some, has the effect of constricting supply and thereby raising world prices. However, because China can be expected to consume the vast majority of any resources it does acquire, the effects of these purchases should be economically neutral. Even if China's equity oil investments "remove" assets from the global market, in the sense that they are not subsequently available for resale, these actions merely displace what the Chinese would have otherwise bought on the open market. Regardless of whether China secures its oil through equity investments or purchases on the global market, its increasing demand for these resources will continue to play a role in world oil markets (as will rising demand from other areas, such as the U.S. and India).

#### A. China's Increasing Need for Energy

China's presence in world energy markets has increased dramatically in the past decades. In 1985, China was wholly self-sufficient in energy and a net exporter of crude oil, petroleum products and coal. China's shares of world energy consumption at that time were relatively small, with a 20.2% share for coal, 3.3% for oil consumption, 0.8% for natural gas and 4.2% for hydroelectricity.<sup>3</sup> In 1993, China became a net importer of petroleum for the first time, and by 2003 China's consumption of energy had jumped dramatically, accounting for 29.2% of world coal consumption, 7.0% of oil consumption, 1.4% of gas consumption, and 10.5 % of hydroelectricity consumption.

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<sup>3</sup> EIA, International Energy Annual 2003.

**Figure 2.1: Map of China and Surrounding Area**



Source: Central Intelligence Agency

Today, China is the second largest consumer of petroleum products, having surpassed Japan with a demand of 6.5 million barrels per day in 2003. The total consumption of petroleum has risen dramatically in recent decades -- from approximately 1.87 million barrels per day in 1980 to approximately 6.5 million barrels per day in 2004. Furthermore, this rise in consumption has led to an increased dependency on imports. As illustrated by Figure 2.2, between 1980 and 2004, China's oil consumption rose dramatically, while production increases were more modest. Since 1993, when China became a net importer of petroleum products for the first time, its import dependence has been growing steadily each year.

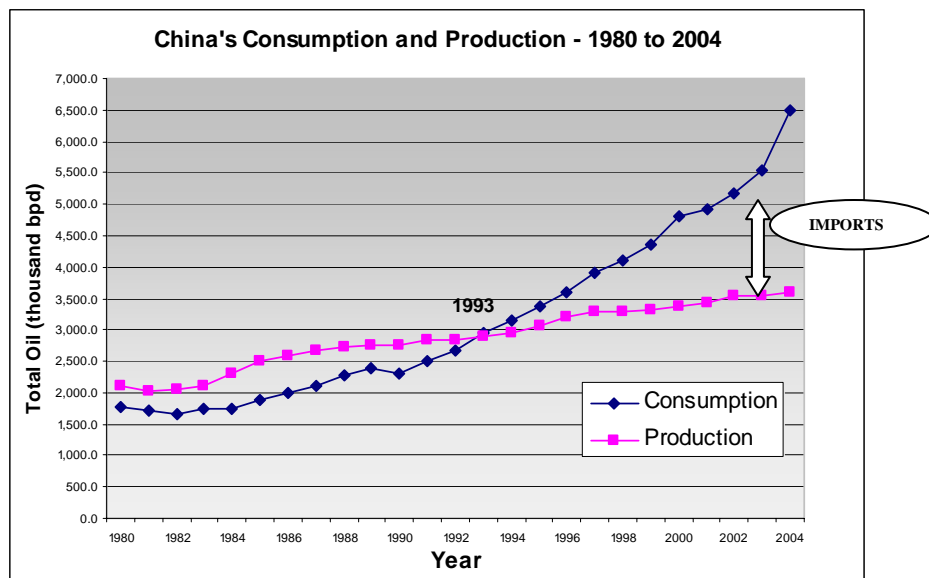
<b>TOP WORLD OIL CONSUMERS 2004</b>		
<b>Rank</b>	<b>Country</b>	<b>Million barrels/day</b>
1	United States	20.7
2	China	6.5
3	Japan	5.4
4	Germany	2.6
5	Russia	2.6
6	India	2.3
7	Canada	2.3
8	Brazil	2.2
9	South Korea	2.1
10	France	2

For example, in 1993 China only imported 1% of its oil from foreign sources. By 2004 approximately 48% of its oil was imported, leaving China with an import dependency of approximately 3 million barrels per day. According to EIA estimates, China's oil demand will continue to rise, reaching approximately 14.2 million barrels per day by 2025. Of that 14.2 million, EIA forecasts that approximately 10.7 million will be imported.

Natural gas currently accounts for only around 3% of total energy consumption in China, but consumption of natural gas is expected to more than double by 2010. China does possess large natural gas reserves of approximately 53.3 trillion cubic feet (Tcf), and it is expected to have among the fastest growth in natural gas use worldwide. Currently, domestic natural gas production is able to satisfy domestic demand, but with consumption expected to increase by an average annual rate of 7.8% between 2002 and 2025, future consumption will have to rely on increases in both domestic production and imports.<sup>4</sup> Current import plans include piped gas from Russia and heightened use of liquefied natural gas (LNG), with the first LNG import terminal under construction.

China's primary energy source is coal. Coal provides about 65% of total primary energy, with annual consumption upwards of 1.5 billion tons (2003), or 29.2% of the world total – making China both the largest consumer and producer of coal in the world. The demand for coal is rising rapidly, with an increase of approximately 36% between 1990 and 2003 and an average growth rate of 2.4%.<sup>5</sup> In addition, approximately 70% of raw coal was directly burned without crushing and screening. Emissions of sulfur dioxide and particulate matter from this manner of coal burning account for approximately 70-80% of total emissions in China.<sup>6</sup>

**Figure 2.2: China's Import Demand**



<sup>4</sup> EIA, International Energy Outlook 2005 (July 2005).

<sup>5</sup> EIA, International Energy Annual 2003 (March 2003).

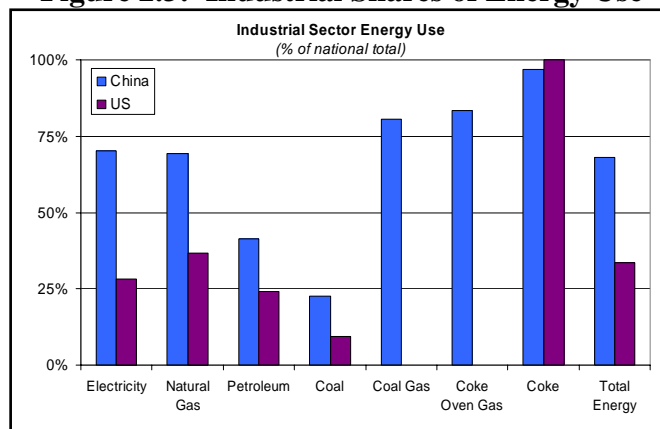
<sup>6</sup> Ibid.

Several factors contribute to such an increase in energy demand in China. The most significant energy demand has come from the country's robust economic growth, which has been fueled by rapid growth in the inefficient industrial sector of the economy. Between 1980 and 2000 China's economy quadrupled, with real GDP growing at rates averaging 9.4% per year through 2004.<sup>7</sup> Though growth rates are projected to decline over the coming decades, the economy will continue to expand at a rapid pace. As is common in the early stages of development, the industrial sector, which is particularly energy intensive, has grown most rapidly in this period. In 2002, energy consumption for the secondary industries (manufacturing of finished goods or products) was 69.3% of total energy consumption, while that for the primary and tertiary industries were 4.4% and 14.9%, respectively.<sup>8</sup> Figure 2.3 below illustrates the large energy demands required by China's industrial sector as compared to the relatively lower demand from the United States' more mature industrial sector.

**Table 2.1 China's Energy Supply and Demand (EIA, 2003)**

	Reserves	Production	Consumption
Oil	18.3 billion barrels	3.41 million barrels per day	5.50 million barrels per day
Natural Gas	53.3 trillion cubic feet (Tcf)	1.21 Tcf	1.18 Tcf
Coal	126.2 billion short tons	1.63 billion short tons	1.53 billion short tons

**Figure 2.3: Industrial Shares of Energy Use**



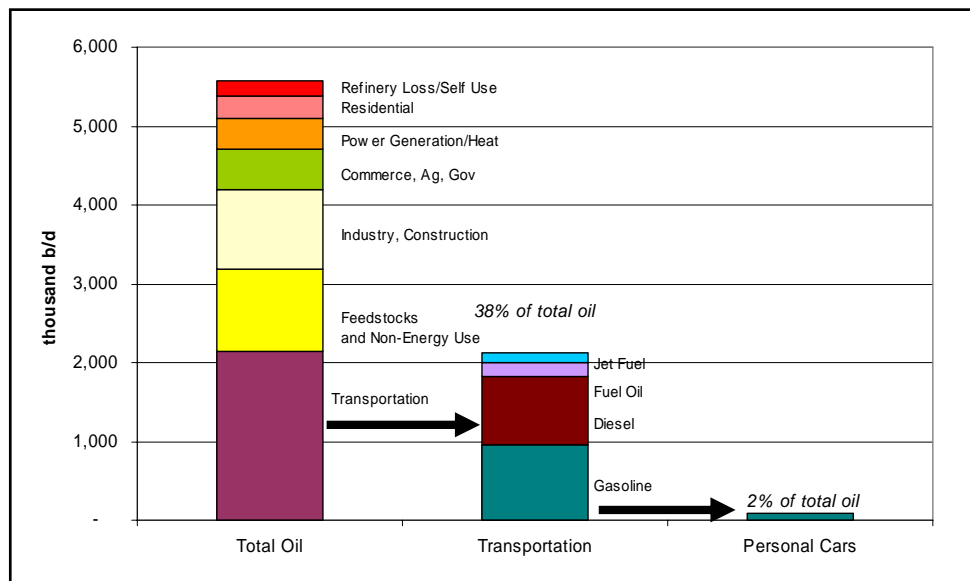
Source: Lawrence Berkeley National Lab

<sup>7</sup> CIA Factbook and Asia Pacific Energy Research Centre "Energy investment outlook for the APEC Region" 2003, pg. 111.

<sup>8</sup> The primary sector of industry generally involves the conversion of natural resources into primary products. The secondary sector of industry generally takes the output of the primary sector and to a point where they are suitable for use by other businesses, for export, or sale to domestic consumers. The tertiary sector of industry involves the provision of services to other businesses as well as final consumers, including the transport, distribution and sale of goods from producer to a consumer as may happen in wholesaling and retailing, or may involve the provision of a service, such as in pest control or entertainment.

It is important to note that much of increased demand is due to the high energy intensity of China's industry. Energy consumption per capita in China is still only a fraction of that of the U.S. or Japan. For example, in 2003, per capita energy in China was 34.9 million btu per person, while that in the U.S. averaged 339.9 million btu per person. However, as in other countries that have experience rapid, sustained economic growth, there has been a significant rise in the middle-class, further increasing China's energy needs. Currently 40.5% of the population lives in urban areas and there are 25 cities with populations over 1 million. With average growth rates in urban areas of 1.4% per year, the percentage will increase to between 55% and 60% by 2020. These urban populations consume approximately 35 times more energy than rural populations, significantly contributing to rising energy demand.<sup>9</sup> A rising middle class also means higher energy demand, as individuals demand higher living standards, more travel by air and more cars on the roads. Ownership of air conditioners in households has increased from 11.6% in 1990 to 61.8% in 2003.<sup>10</sup> The market for personal cars is growing at 50% to 60% annually and energy demand for all road transport is projected to grow by 4.6% per year from 2004 to 2030.<sup>11</sup> About 2.6 million sedan cars were produced in 2004, about a 26% rise from 2003. Air travelers in China more than tripled from 1990 to 2002, going from 27.3 million to 83.7 million. According to research conducted at the Lawrence Berkeley National Laboratory, transportation currently accounts for 38% of all oil demand. They further project that by 2020 transportation will account for nearly 50% of all oil demand, with personal cars growing from 2% of demand to approximately 10% of demand (see Figures 2.4 and 2.5 below).<sup>12</sup>

**Figure 2.4: Breakdown of Oil Use in China – 2003**



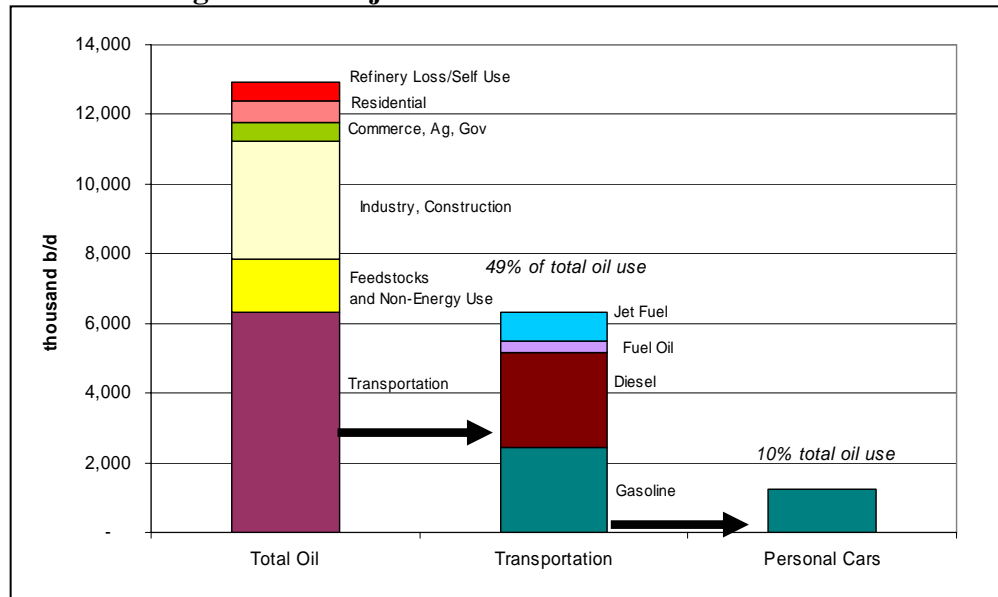
<sup>9</sup> Kong, "An Anatomy of China's Energy Insecurity and Its Strategies," Pacific Northwest National Laboratory; November 2004, page 10.

<sup>10</sup> Crompton, Paul and Yanrui Wu, "Energy Consumption in China: Past Trends and Future Directions" *Energy Economics*: Volume 27, Issue 1, January 2005, Pages 195-208.

<sup>11</sup> *World Energy Outlook 2004*, published by the International Energy Agency.

<sup>12</sup> Presentation by David Fridley of Lawrence Berkeley National Lab, "China's Energy Future to 2020 *Initial Results*" presented to Department of Energy, November 29, 2005.

**Figure 2.5: Projections for Oil Use in China – 2020**



## B. Energy Sector in China

China's energy industry is dominated by three state owned oil companies – all of which were established in the 1980s (See Appendix A for more detailed timeline). The China National Offshore Oil Corporation (CNOOC), founded in 1982, controlled most of the offshore oil business. The China Petrochemical Corporation (Sinopec), founded in 1983, was responsible for refining and marketing, and the China National Petroleum Corporation (CNPC), created in 1988, was responsible for exploration and production onshore and in the shallow off-shore areas.

In 1998, aiming to make state oil and gas companies more like vertically integrated corporate entities elsewhere (and partly in preparation for the accession to the World Trade Organization), Premier Zhu Rongji reorganized CNPC and Sinopec into two integrated oil companies. Each company was reorganized along geographic lines instead of functional lines, with integrated business capacity covering oil exploration, production, refining and sales.<sup>13</sup> Sinopec's refineries in the north were handed over to CNPC in exchange for CNPC's oil fields in the east. However, CNPC remains China's dominant upstream oil company while Sinopec continued to dominate downstream.<sup>14</sup> The restructuring also included the transfer to Sinopec and CNPC of provincial and municipal petroleum companies that were responsible for distribution of petroleum products to end-users and petrol stations—those in the south and the east to Sinopec and those in the north and west to CNPC. In addition, there were also reforms in the marketing of

<sup>13</sup> Day, Mark. "Opening China's Oil Reserves to the World," *International Financial Law Review*. London: Aug 2000. Vol 19, Iss 8; pg 35.

<sup>14</sup> Country Analysis Brief for China, published by EIA 2005.

petroleum products, giving CNPC and Sinopec the right to market their products directly.<sup>15</sup>

CNOOC, on the other hand, was created to work with foreign firms, and more closely resembled the international majors than the more insular CNPC and Sinopec. The firm's specific purpose is to attract foreign company investment into exploration and development of China's offshore resources because China lacked the necessary deep-water technology and major project management expertise.

**Table 2.2 Key Feature of Oil Firms in China (as of 2003)<sup>16</sup>**

	<b>CNPC</b>	<b>Sinopec</b>	<b>CNOOC</b>
<b>Crude Oil (% of national total)</b>	2.2 million b/d (63%)	770 thousand b/d (22%)	481 thousand b/d (14%)
<b>Natural Gas (% of national total)</b>	2.8 bscf/d* (70%)	0.6 bscf/d (14%)	0.5 bscf/d (12%)
<b>Refining Capacity</b>	2.7 million b/d (41%)	3.4 million b/d (53%)	none
<b>Principle Oil Fields</b>	Daqing oil field		Bohai Bay
<b>Business Area</b>	North and West China	South and East China	Offshore China
<b>Stock IPOs of sub firms</b>	PetroChina listed on Hong Kong and New York exchanges in April 2000, raising US\$ 3 bn	Sinopec Corporation listed on Hong Kong, New York, and London exchanges in October 2000, raising US\$3.7 bn	CNOOC Ltd raised US \$1.3 bn on Hong Kong and New York stock exchanges in Feb 2001
<b>Oil Major Participation</b>	BP: US \$620 mm (21%)	BP: US\$400 mm (10%) ExxonMobil: US\$1 bn (26%) Shell: US \$430 mm (12%)	BP: US\$200 mm (15%) Shell: US\$ 300 mm (24%)

\* Billion standard cubic feet per day

Furthermore, China currently has five designated state oil trading companies:<sup>17</sup>

- Sinochem: One of the oldest trading companies in China—established in the 1950s.
- Chinaoil: Established in January 1993 as a 50/50 joint venture (JV) between Sinochem and CNPC. Currently Chinaoil is a trading subsidiary of CNPC/PetroChina.
- Unipec: Established in February 1993 as a 50/50 JV between Sinochem and Sinopec. Currently Unipec is a trading subsidiary of Sinopec.
- Zhuhai Zhenrong Oil Trading Company: Established in the mid-1990s and has the exclusive right to import crude oil from Iran. It has also recently entered the fuel oil import business and actively explores investment opportunities in other areas.

<sup>15</sup> Day, Mark, "Opening China's oil reserves to the world" *International Financial Law Review*, London: August 2000. Volume 19, Issue 8; page 35.

<sup>16</sup> "Energy Investment Outlook for the APEC Region" Asia-Pacific Energy Research Centre, 2003.

<sup>17</sup> Wu, Kang and Tom Corcoran. "China's Global Petroleum Investment by State Oil Companies," prepared by FACTS, Inc. for the U.S. Department of Energy, October 2005.

- CNOOC-Sinopec International Trading Company: Established in May 2004, the newest state oil trading company is 60%-owned by CNOOC and 40% by Sinopec.

In addition to the above, China has many other oil trading companies, particularly for fuel oil imports. Each year since the end of 2001, when China joined the World Trade Organization (WTO), China has allocated a certain amount of its crude oil and refined product import quotas to oil trading companies other than the five mentioned above.

### *Market Transformation*

China's economy has been in the process of transition from a state-controlled economy to one that is more market-based. Since entry into the WTO in November 2001, the Chinese government has made a number of specific commitments to trade and investment liberalization that, if fully implemented, will substantially open the Chinese economy to foreign firms. In the energy sector, this will mean lifting (or sharp reductions of) tariffs associated with imports of some classes of capital goods and eventually opening some areas, such as petroleum sales, to foreign competition.<sup>18</sup>

In addition, all three Chinese oil and gas companies successfully carried out initial public offerings (IPOs) of stock between 2000 and 2002. PetroChina was formed in 1999 from many of CNPC's high quality oil- and gas-related assets and carried out its IPO of a minority interest on both the Hong Kong and New York stock exchanges in April 2000. Sinopec carried out its IPO in New York, Hong Kong and London in October 2000. CNOOC held its IPO of a 27.5% stake in New York and Hong Kong in February 2001. In 2002, Chinese oil companies began to look at separating out some of their business units into subsidiaries. CNPC has set up subsidiaries for drilling services and geological survey work, and eventually plans to spin them off through international IPOs. CNOOC also has created an oilfield services unit, China Oilfield Service, Ltd. (COSL), which was listed on the Hong Kong stock exchange in November 2002. However, the Chinese government still holds majority stakes in all three listed companies.

Additionally, there has always been a growing presence of private oil companies in China, mainly in such businesses as retail, transportation, small refining, petrochemicals/chemicals and imports/exports of certain refined products. These non-state-owned companies – some more influential than others - await the liberalization of the energy sector. One recent headline case was the establishment of the Great United Petroleum Holding Co. (GUPC) in June 2005. It is reportedly comprised of over 30 domestic private companies, with a registered capital of 870 million yuan (US\$107 million) and the total assets of 5 billion to 10 billion yuan (US\$609 million to US\$1.2 billion).<sup>19</sup> While the establishment of GUPC might signify a bigger and more influential private company presence in China's energy industry, it is still unclear whether it will be a viable driver for transformation as it too has come to face government restrictions similar to many other non-state-owned oil companies. In essence, the government policy continues to favor the monopoly of the large state oil companies.<sup>20</sup> For example, GUPC

<sup>18</sup> China Country Analysis brief, EIA.

<sup>19</sup> Interview with Dr. Kang Wu, January 4, 2005.

<sup>20</sup> Ibid.



has not yet been granted a wholesale license for selling products or a license to import oil products.<sup>21</sup> These private companies face non-governmental challenges, too. They generally lack advanced exploration technology and adequate capital. Also, PetroChina and Sinopec are the dominant players in the Chinese refining sector.

Western oil and gas companies have also been increasingly prominent in China's energy sector. The super-majors have shares in the Chinese oil and gas companies: British Petroleum was the largest purchaser at 20% of the shares offered at CNPC/PetroChina's IPO in April 2000; ExxonMobil, BP and Shell bought about \$2 billion in shares at the Sinopec IPO in October 2000; and Shell bought about \$200 million in shares of CNOOC at its IPO in February 2001. U.S. majors are also active in China's offshore development operations via development partnerships with the Chinese majors. ConocoPhillips developed the 32,000 b/d Penglai 19-3 field (as of mid 2004), where production began in December 2002. Another major offshore oilfield has been developed in the Pearl River Mouth area by a consortium including Chevron, ENI, and CNOOC. Chevron also concluded an agreement with CNOOC in October 2002 for the development of the Bozhong field in the Bohai Sea.

### C. China's Energy Policy-Making Institutions

Until the 1980s, China had a hierarchical administrative system where individual ministries and commissions – under the State Council – extended their management powers from the central to the local governments through agencies at various levels (See Appendix A for brief timeline).<sup>22</sup> In 1988, the Ministry of Energy was established and remained in place until 1993 when separate Ministries of Coal and Electric Power were reestablished.<sup>23</sup> Since 1993 there has existed no unitary central energy policy-making body in China, although the State Planning Commission (SPC) (later the State Development Planning Commission and now the National Development and Reform Commission--NDRC) exerted de facto control of the energy sector because the SPC had to authorize all major spending for capital projects. The Ministries of Coal and Power remained until 1998, when further restructuring diffused policy-making by disbanding these ministries and delegating their power among several agencies, including the NDRC; the Ministry of Land and Resources; the Ministry of Water Resources; the Ministry of Science and Technology (MOST); the State Commission of Science, Technology and Industry for National Defense (COSTIND); the Chinese Academy of Engineering; the State Electricity Regulatory Commission (SERC); and the State Assets Management Commission.<sup>24</sup>

The NDRC has assumed the dominant role over day-to-day implementation of energy policies. The NDRC, which expanded into a super ministry to include 22 departments after government restructuring in 2003, is responsible for social economic strategies,

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<sup>21</sup> The China Daily, "First Private Oil Company Sets Up Amid Disputes," June 29, 2005. [http://www.chinadaily.com.cn/english/doc/2005-06/29/content\\_455665.htm](http://www.chinadaily.com.cn/english/doc/2005-06/29/content_455665.htm) .

<sup>22</sup> China Energy Series, Issue #1 September 2005 prepared by FACTS, Inc.

<sup>23</sup> Ibid.

<sup>24</sup> Ibid.

long-term planning, large-scale projects, and price monitoring, among others. Its Bureau of Energy, with a staff of about 30 employees, is responsible for initiating energy development strategies and energy development plans; energy conservation and renewable energy development; as well as managing the oil (including petroleum reserves), natural gas, coal and electric power sectors. Additionally, within the NDRC, the Department of Price sets prices for gasoline and diesel, natural gas and electric power; the Department of Price Monitoring and Inspection is responsible for monitoring price movements and possible violations; and the Department of Industrial Policies is in charge of the refining and petrochemical sector.

Today, the NRDC has to coordinate with several other agencies (see Box 2.1 and Figure 2.6 below). The Ministry of Land and Resources is responsible for the licensing of acreages and blocks for upstream exploration and mining and must be involved in any decisions regarding mine drilling. The Ministry of Water Resources must be involved in all dam projects; the State Environmental Protection Agency must be involved in anything regarding pollution control, and the State Electricity Regulatory Commission in all power investment and power plant construction projects. The State Assets Management Commission is responsible for regulating large state assets held by numerous state-owned enterprises (SOEs) and serves as the state shareholder in SOEs. In the area of oil trading, the Ministry of Commerce issues licenses and determines quotas for imports and exports of crude and major refined products.

The most recent and notable development is the May 2005 establishment of the National Energy Leading Group (NELG) at the State Council. The NELG is headed by Premier Wen Jiabao. Its deputy heads include Vice Premiers Huang Ju and Zeng Peiyan, the former State Development and Planning Commission Chairman, and the members include 12 ministers, including the Defense Minister and a People's Liberation Army Deputy Chief of Staff. The establishment of this new government body aims to enhance the nationwide coordination of strategic and comprehensive energy matters, including energy planning and policies, energy security, conservation, and international energy cooperation at the top leadership level.

In June of the same year, the NELG established the National Energy Office (NEO), headed by NDRC Chairman Ma Kai.<sup>25</sup> The NEO will have 24 officials once it is fully staffed and ranked at the deputy ministerial level. The NEO will handle the routine operations for NELG, and its tasks will include: implementing policies and decisions made by NELG, tracking the development and status of energy security, forecasting and issuing warnings on strategic energy problems, providing policy recommendations to NELG, organizing relevant departments and institutions to conduct research on energy strategies and planning, and studying important policies with regard to energy development and conservation, as well as international cooperation on energy.<sup>26</sup>

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<sup>25</sup> Ibid.

<sup>26</sup> Ibid.

### **Box 2.1 Major Governing Bodies in Energy Sector**

**State Council:** The supreme government body in charge of all economic activities in China, including the state oil companies. The premier is Wen Jiabao, whose current term ends in March 2008.

**National Energy Leading Group (NELG):** Established in May 2005. The mission of the NELG is to study major policy issues concerning China's national energy development strategy, energy development, conservation, energy security, and emergency responses as well as international energy cooperation. It is responsible for providing advice and policy recommendations to the State Council.

**National Development and Reform Commission (NDRC):** Expanded in March 2003, the NDRC is in charge of social economic strategies, long-term planning, large projects, improvement of industrial structures, price monitoring, and other issues. For energy in particular, NDRC is responsible for policy issues and general planning at the national level for oil, gas, coal, and electric power. State oil companies are able to decide on their own annual investment plan but investment plans for large projects must be approved by the NDRC or the State Council depending on the size of the investment. The Chairman of NDRC is Mr. Ma Kai.

**National Energy Office (NEO):** Established in June 2005 within the NDRC reporting directly to the NELG. The NEO is also chaired by Mr. Ma Kai. The NEO handles the routine work of the NELG. Its tasks include: implementing policies and decisions made by NELG, tracking the development and status of energy security, forecasting and issuing warnings on strategic energy problems, providing policy recommendations to NELG, organizing relevant departments and institutions to conduct research on energy strategies and planning, and studying important policies with regard to energy development and conservation, energy security, emergency responses as well as international cooperation on energy.

**Bureau of Energy (BOE):** Headed by Mr. Xu Dingmin, the Bureau also houses the National Office of the Strategic Petroleum Reserves (SPRs). The Bureau has direct responsibilities for the implementation of energy policies for petroleum, coal, and electric power industries in China.

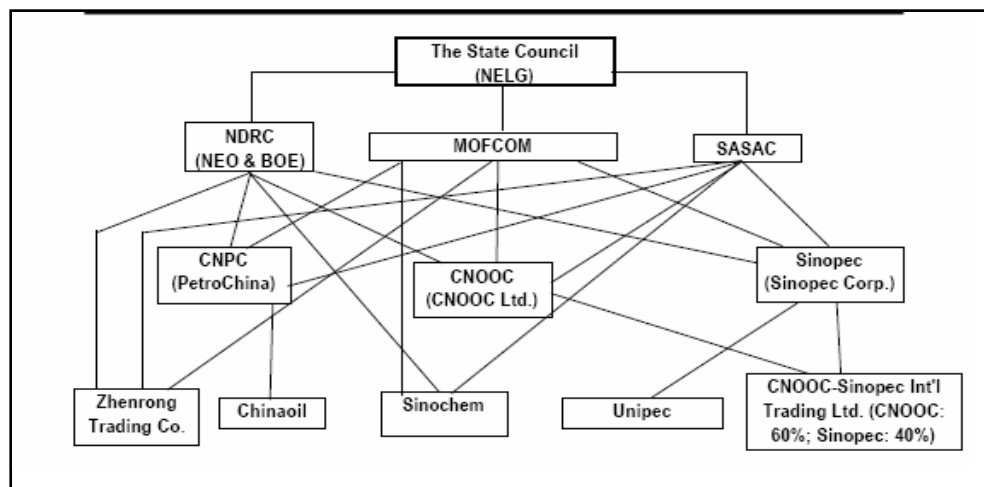
**State-Owned Assets Supervision and Administration Commission (SASAC):** The major responsibilities of the SASAC are to regulate the huge state assets held by numerous state-owned enterprises (SOEs), to serve as the state shareholder in SOEs and to promote the restructuring of state assets and establishment of modern enterprises. The SASAC Chairman is Mr. Li Rongrong, formerly the Chairman of the now defunct State Economic and Trade Commission.

**Ministry of Commerce (MOFCOM):** This new ministry was established in March 2003 to oversee both foreign and domestic trade. MOFCOM sets import and export rules for state oil companies. The current minister of MOFCOM is Mr. Bo Xilai, former governor of Liaoning Province.

**Ministry of Land and Natural Resources:** Established in March 1998, the ministry is in charge of licensing acreage and blocks for upstream exploration and mining. The current minister is Mr. Sun Wensheng, formerly the governor of Shandong Province.

The role of the Chinese Communist Party (CCP) in directing the activities of the State as it relates to energy security and acquisition is not always apparent. It is important to note, however, that in China's party-state system, the Chinese Communist Party plays a dominant role in policy decision-making and economic affairs at virtually all levels. This is especially the case in economic sectors deemed to be of strategic importance. It is likely, therefore, that the National Energy Leading Group -- though organizationally a component of the State Council -- reports to and receives direction from the Party Central Committee's Politburo or its Standing Committee.

**Figure 2.6: Organizational Chart of China's Petroleum Sector, 2005**



The government also exercises control over the petroleum market. Retail prices for petroleum products are regulated, with variations based on location and the type of consumer. Recently, there has been substantial pressure to raise domestic prices in the context of high world oil prices. A series of increases in the state-mandated prices, however, has still not been sufficient to keep pace with the world market. This has led, particularly in the first half of 2005, to increases in exports of some petroleum products, particularly diesel, as the gap between domestic prices and world prices widened.

#### D. Relationship between Energy Industry and Chinese Government

The relationship between the state oil companies and the government proper manifests itself in different ways.

The government owns 80% to 90% of the three largest publicly-listed oil companies of China: PetroChina, Sinopec Corp, and CNOOC Ltd., and 100% of their parent companies: CNPC, Sinopec, and CNOOC. Currently, the State-Owned Assets Supervision and Administration Commission is the representative of the state shareholder in these companies. For these reasons, all managers of the state oil companies are appointed by the government, with SASAC playing a central role and the State Council making the final decision on all management personnel nominations.<sup>27</sup>

Second, the executives of the national oil companies are all of ministerial level in terms of their official status, and many have held high-ranking positions within government agencies. For example, a senior official of CNPC 1988 to 1998, Zhou Yongkang later served as Minister of Land and Resources (1998-1999), Secretary of the Sichuan Provincial Party Committee (1999-2002), and is currently a Member of the Political Bureau and member of the Secretariat of the CPC Central Committee, and the Minister of

<sup>27</sup> Wu, Kang and Tom Corcoran. "China's Global Petroleum Investment by State Oil Companies," prepared by FACTS, Inc. for the U.S. Department of Energy, October 2005.

Public Security.<sup>28</sup> In addition, Ma Fucai, former general manager of CNPC until 2004, has recently been appointed to the National Energy Office as a deputy-minister.<sup>29</sup> Similarly, the chairman of Sinopec, Chen Tonghai, is a former vice-chairman of the State Development and Reform Commission, and Wei Liucheng, former Chairman of CNOOC, is now Governor of Hainan Province.<sup>30</sup>

Third, the state oil companies must implement various elements of energy policies formulated by the government with the basic target of ensuring the smooth supply of oil to the country. The elements they must implement include, but are not limited to, oil and gas upstream exploration, development, production, transportation, refining, trade, and marketing. The government no longer directly manages day-to-day operations of these companies, but it does provide the companies with optional guidelines. Though not mandatory, the Chinese state oil companies often choose to follow these guidelines, as compliance helps to ensure government protection when necessary. However, recent years have seen some conflicts as the companies have begun to lobby for their commercial interests when they believe the central government's guidance will adversely affect their bottom line.<sup>31</sup>

Fourth, the Chinese government has done many things in the past to protect the interests of the state oil companies. For example, in early 1998, when the state oil companies had thin profits or lost money, the Chinese government adopted a series of measures (including cracking down on small refineries, small oil producers, smuggling, suspension of the People's Liberation Army's involvement in the oil business, and banning diesel and gasoline imports) to shore up the profit margins of state oil companies. From 2001 onwards, in preparation for China's entry into the WTO and during the early years of China's WTO membership, state oil companies were granted monopoly powers over many business areas to strengthen their bottom lines, including the refining business, wholesale oil business, retail stations, and the oil trade. Nonetheless, the government has a long-term goal of making the state oil companies more efficient.

Finally, although the government ultimately holds all authority, the state oil companies often act in their own interest at times, regardless of government directives. For example, when the Chinese government moved to tighten fuel standards for oil products, the state oil companies resisted changing the specifications as quickly as the central government originally proposed. When the government adopted price control policies to keep the prices of domestic oil products low and produced huge losses for state refiners in 2005, the state oil companies reacted by constraining crude runs, reducing product imports, and increasing product exports. This prompted the government to take more measures to ensure manageable prices for domestic oil products, such as banning the export of certain

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<sup>28</sup> People's Daily Online, "Zhou Yongkang Bio" <http://english.people.com.cn/data/people/zhouyongkang.shtml>, accessed Oct 17, 2005.

<sup>29</sup> The China Daily "China Creates Office to Safeguard Energy" [http://www.chinadaily.com.cn/english/doc/2005-04/28/content\\_438564.htm](http://www.chinadaily.com.cn/english/doc/2005-04/28/content_438564.htm), accessed October 17, 2005.

<sup>30</sup> China Vitae website, biographies for Chen Tonghai and Wei Liucheng, found at <http://chinavitae.com/>, accessed on October 17, 2005.

<sup>31</sup> Wu, Kang and Tom Corcoran, 2005.

refined products, leaving the companies with no option but to sell their products at home.<sup>32</sup>

### **III. China's Energy Policy**

As noted above, China's demand for energy, oil in particular, has been growing rapidly. This has led to a need for specific policy responses in order to both manage demand and increase supply of energy.

#### A. China's Economic Growth Strategy and Energy Policy

Over the past two decades, China has experienced major economic and social—and, to a far lesser extent, political—changes as a result of Deng Xiaoping's historic call for "socialism with Chinese characteristics." The results have been explosive economic growth, a dramatic migration of millions of Chinese from rural provinces to urban centers, an opening to the outside world not seen since a century ago, a reorganization of government and corporate structures, and the elimination of the Maoist social support system ("the iron rice bowl"). This massive change, not surprisingly, has at times occurred in fits and starts. Internal and international tensions have resulted from the shift from small-scale to world-scale manufacturing and the transition from autarkic to internationally integrated economic policy. Finally, tensions continue between increasingly capitalist economic structures and a desire by the CCP to maintain its political monopoly and to continue to control what the CCP considers strategic industries, including energy.

China's energy policy-making lies at the intersection of these many interests for the Chinese government. China's simultaneous dependency on exports, foreign direct investment, and imported commodities, exposes the inefficiencies of its post-communist economy to the forces of globalization. In addition, similar to policies Japan has previously pursued, China has tended to seek energy security by developing equity positions in oil producing countries, i.e. "removing" energy sources from the market, even at substantial premiums. This confluence of drivers shapes China's energy policy.

China is attempting to meet projected energy needs by increasing domestic energy production and efficiency. However, domestic sources of oil are producing at capacity and may have peaked. This leads most analysts to think that future demand increases will have to depend mostly or entirely on foreign sources. The continued growth in energy consumption and increased reliance on imported energy resources has important security implications for China. As is typical for all Far Eastern importers, China's oil suppliers are heavily concentrated in the Middle East and West Africa – both regions that are subject to internal and international instability that may negatively impact China's oil supply security. In addition, the fact that more than 80% of China's crude oil imports transit the Strait of Malacca and 24% through the Strait of Hormuz increases China's sense of vulnerability. Another source of concern for China is that while more than 90%

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<sup>32</sup> Wu, Kang and Tom Corcoran, 2005.

of China's crude imports are carried by ship, less than 10% are shipped aboard Chinese-owned tankers.<sup>33</sup>

Efforts to address perception of energy insecurity have led the Chinese government to finance many energy projects that have uncertain prospects of a positive return-on-investment; to absorb political risk where it has proven prohibitive to private commerce; and to establish closer relations with “problem states,” such as Sudan, that are rich in energy. All of these policies have an impact on strategic U.S. interests.

## B. Securing Domestic Energy Supply

The Chinese government has undertaken specific policies in order to reduce demand and increase the supply of energy available domestically. These policies include, increasing energy efficiency to maximize energy output from existing resources, increasing the use of renewable energy, and increasing both the domestic production of traditional energy resources and improving domestic infrastructure, such as refinery capacity and pipelines.

### 1. Increase Energy Efficiency and Use of Renewable Energy Resources

According to the NDRC, energy efficiency in China is about 10 percentage points below that of the advanced world level. For example, the average efficiency of Chinese thermal power generation is about 33.8%, which is 6-7 percentage points lower than more advanced countries. This means that in the various phases of energy utilization (processing, storage, transport and transmission, etc) there are significant losses and wastes of energy. Further, energy consumption per \$1 million of GDP (calculated using the 2005 exchange rate) is approximately 1300 tons of coal equivalent (tce) for China, 2.4 times more than the world average, while energy consumption per unit of product of eight major industries (electric power, iron & steel, nonferrous metal, petrochemical, building material, chemical light industry and textile industries) was on average 40% higher than the most advanced world level. In addition, energy consumption for space heating per building area in China is 2-3 times as much as in developed countries with similar climatic conditions.<sup>34</sup> The gap in energy utilization between China and other countries indicates the existence of a huge energy savings potential and a potential reduction in overall energy demand.

The Chinese government has stated that it aims to quadruple its GDP by 2020 while only doubling its energy use. However, significant improvements in energy efficiency must still be made in order for the Chinese to reach their 2020 goal.<sup>35</sup> To address this issue, the NDRC published the “China Medium and Long Term Energy Conservation Plan,” in January 2005. This document outlines China’s plan for meeting its conservation goal while maintaining strong economic growth. This conservation plan detailed specific conservation efforts in a variety of sectors and industries, including coal-fired industrial boiler retrofit projects, installation of combined heat and power (CHP) cogeneration,

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<sup>33</sup> Kong, page 15.

<sup>34</sup> “China Medium and Long Term Energy Conservation Plan” published by NDRC, January 2005.

<sup>35</sup> Sinton, Jonathan, et al, “Evaluation of China’s Energy Strategy Options,” Lawrence Berkeley National Laboratory, May 2005.

development of alternative fuel vehicles and high efficiency motors, building energy conservation projects (both commercial and residential), energy efficient lighting, and several others. If all of the projects detailed in this plan are implemented, the Chinese could realize a total savings of approximately 240 tons of coal equivalent (tce) in a five-year period.<sup>36</sup>

China is taking active steps in other areas as well. In 2003, China's National People's Congress passed stricter fuel efficiency standards than those in the U.S. These standards call for cars to get up to two more mpg than the average in the U.S.<sup>37</sup> An \$80 million program was also recently launched with the United Nations to promote energy efficiency, aiming to reduce energy consumption by nearly 19 million tons of coal equivalent thereby reducing emissions by 12 million tons.<sup>38</sup> Furthermore, over the last two years the Chinese government has raised electricity prices twice, with higher prices adopted for peak consumption times in particular provinces and differentiating power prices for six raw materials sectors, including aluminum, cement and steel. An extra 0.02 yuan or 0.05 yuan will apply to enterprises that fail to meet specific requirements.<sup>39</sup>

Renewable resources also have the potential to make a large contribution to decreasing China's demand for fossil energy. Currently, renewable energy resources only account for 6% of China's total energy consumption, but in February 2005, the National People's Congress passed the Renewable Energy Law, which legalizes the regulatory framework for renewable energy development, provides economic incentive and financial support for R&D, and promotes construction and utilization of renewable energy facilities.<sup>40</sup> The Chinese government also sees renewable energy as an integral part of its long-term strategy, with the plan to have 10% of energy consumption from renewable sources by 2010, 18% by 2020 (see Table 3.1), 30% by 2030 and 50% by 2100.<sup>41</sup> In order to help meet these goals, the Chinese government has secured financing from both the World Bank (\$87 million) and the Global Environmental Facility (\$40.22 million).<sup>42</sup>

**Table 3.1: Summary of Increases in Renewable Energy**

<b>Renewable Technology</b>	<b>In 2004</b>	<b>By 2020</b>
Hydroelectric capacity	108 GW	290 GW
Wind	760 MW	30 GW
Solar thermal	65 million square meters	300 million square meters
Solar PV	65 MW	2 GW
Biomass	Develop capacity for 20 GW	

Source: NDRC "Mid- and Long-term Development Plan of Renewable Energy"

<sup>36</sup> NDRC "China Medium and Long Term Energy Conservation Plan."

<sup>37</sup> "China Set to Act on Fuel Economy." The New York Times, November 18, 2003.

<sup>38</sup> "China Launches Energy Efficiency Programme" Reuters, July 5, 2005.

<sup>39</sup> Kong, 32.

<sup>40</sup> Renewable Energy Law Creates New Opportunity" People's Daily Online [http://english.people.com.cn/200503/01/eng20050301\\_175162.html](http://english.people.com.cn/200503/01/eng20050301_175162.html).

<sup>41</sup> NDRC "Mid- and Long-term Development Plan of Renewable Energy."

<sup>42</sup> World Bank Press Release, "World Bank Helps China Scale up Renewable Resource," June 17, 2005.



## 2. Increase Domestic Production and Infrastructure

### *Oil*

The Chinese government has taken several steps to increase domestic sources of oil. The Daqing oil field, inaugurated in 1967, accounts for about a quarter of China's total crude oil production. Although it continues to be the largest oil field in China, Daqing peaked in the 1970s and its production levels have been steadily declining in recent years. After supplying the country with more than 50 million metric tons of oil annually for 27 years, Daqing failed to meet that level for the first time in 2003. In fact, production has been declining steadily at an average annual rate of 2.6% since 1997 and its production will likely fall below 20 million tons by 2010.<sup>43</sup> In order to make up for this decline, CNPC has contracted with several foreign firms to work to enhance oil recovery and extend the life of the second-largest producing field, Liaohe in northeastern China. In April 2004, Chinese authorities announced several new finds in the area of an existing Shengli field in the northeast, and oil production is expected to extend there.<sup>44</sup> China also opened up far western reserves in Xinjiang province. The Tarim Basin, Junggar Basin and Turpan-Hami Basin combined boast 20.9 billion tons of oil and 10 trillion cubic meters of natural gas, accounting for 30% of the country's proven oil reserves and 34% of its proved gas reserves. Local governments are pushing to increase production from these basins to 50 million tons by 2010.<sup>45</sup> Despite significant efforts to increase domestic production, these new discoveries will not offset declining production.

The Chinese government has also been focusing on increasing offshore production in order to reduce dependence on foreign oil. Nearly 85% of China's oil production capacity is located onshore. However, offshore production has been growing at an average of 15.3% per year, with production reaching 28.4 million tons in 2004 and accounting for 16.2% of total domestic supply. The Chinese government hopes to make offshore production China's largest source of oil by doubling production to 67 million tons by 2010.<sup>46</sup>

Recent offshore oil exploration interest has centered on the Bohai Sea area, east of Tianjin, believed to hold more than 1.5 billion barrels in reserves, and the Pearl River Mouth area. ConocoPhillips began commercial production of the Peng Lai find in Block 11/05 in December 2002 and is planning a \$1.8 billion investment to further develop its holdings in the Bohai Sea, eventually raising production at Peng Lai to 140,000 bbl/d. CNOOC brought its Luda heavy oil field in the Bohai Sea into production in early 2005. In July 2001, CNOOC signed a production-sharing contract with Canadian independent Husky Oil for Block 39-05 in the Pearl River Mouth, near the Wenchang 13-1/13-2 blocks. In October 2002, Chevron also concluded an agreement with CNOOC for the development of the Bozhong field in the Bohai Sea, which has reserves estimated at 1.3 billion barrels, and is expected to begin production in the third quarter of 2005. In

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<sup>43</sup> Kong, 35.

<sup>44</sup> China Country Analysis Brief, EIA 2005.

<sup>45</sup> "Xinjiang Plans to Be China's Top Oil Producer" *People's Daily*, Online Edition, June 14, 2005, [http://english.people.com.cn/200506/14/eng20050614\\_190148.html](http://english.people.com.cn/200506/14/eng20050614_190148.html). Accessed October 7, 2005.

<sup>46</sup> Kong, 35.

February 2005, Kerr-McGee signed a production-sharing contract (PSC) for deepwater Block 43/11, southeast of Hong Kong. Kerr-McGee is funding 100% of the exploration costs, but CNOOC has farm-in rights for a 51% stake in the development phase, if oil is discovered.<sup>47</sup>

### *Coal*

Coal, which currently accounts for roughly 65% of total energy consumption, will continue to dominate the energy markets in China. While the share of coal in total energy is expected to decline to 58% in China by 2025, gross volumes are projected to increase from 1,422 million short tons in 2002 to 3,242 million short tons in 2025.<sup>48</sup> These levels of coal consumption are major environmental and infrastructure concerns for China and the world. The coal sector has shown some signs of trouble over the past few years, specifically in relation to transportation bottlenecks that have prevented the distribution of this abundant resource. With the rapid growth in many sectors of the economy, there are several competing uses for the railroad system – iron ore, steel, grains, etc. – of which coal is only one. Coal supply shortages (and resulting power outages) have occurred in part because of insufficient railroad infrastructure that causes coal shipments to be stranded at mines.

Recently, China has started to investigate the possibility of increasing its use of coal as a direct substitute for oil by investing in coal liquefaction technology (which seeks to form petroleum products from coal). Currently China's central planners have proposals for about US\$24 billion worth of large-scale coal liquefaction projects. Sasol, South Africa's chief producer of oil from coal, is currently investigating the feasibility of establishing two coal liquefaction plants in China – one in Shaanxi province and the other in the Ningxia region – at a cost of around US\$6 billion. Optimistically, if all of the proposed US\$24 billion in liquefaction projects are realized, this process could replace up to one million barrels of oil a day.<sup>49</sup>

### *Natural gas*

Historically, natural gas has not been a major fuel in China, but given China's untapped domestic reserves of natural gas and the environmental benefits of using natural gas, China has embarked on a major expansion of its natural gas infrastructure, most notably the construction of the West-to-East pipeline. This pipeline links natural gas deposits in the Tarim Basin and the Ordos Basin to major demand centers along the southern coast. China also is interested in the possibility of imports from Russia and Kazakhstan via pipeline (see C.1 below). Imported liquefied natural gas (LNG) will be used primarily in China's southeastern coastal region, with possible later expansion in the North, particularly if Russian supplies fail to materialize. China is constructing its first LNG receiving terminal near the city of Guangdong. A supply contract has been signed for LNG from Australia's North West Shelf gas project. The second terminal is under construction in Fujian Province and is to be completed in 2007. A supply agreement has

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<sup>47</sup> China Country Analysis Brief, EIA 2005.

<sup>48</sup> EIA, International Energy Outlook, July 2005.

<sup>49</sup> "China looks at \$14 billion coal-to-oil plan as Beijing bts on oil price staying high" *Financial Times*, September 27, 2005.

been concluded with BP for LNG from its Tangguh project in Indonesia, where 2.6 million tons will be transferred from Indonesia beginning in 2007 under a 25-year contract. Other provinces, including Jiangsu, Zhejiang, Liaoning, Hebei, Shandong, and Shanghai are also considering siting LNG receiving terminals.

#### *Nuclear and hydroelectricity*

Continued growth in energy consumption will also force a growth in nuclear and hydroelectricity. China is ambitiously developing its nuclear power industry, with some of the most aggressive development plans worldwide. China's total nuclear power generation capacity has increased dramatically in the past few years, from two giga-watts (GW) at the beginning of 2002 to 6.6 GW as of mid-2005. China plans to spend 400 billion yuan – approximately US\$50 billion – on 30 additional nuclear reactors within the next 15 years.<sup>50</sup> This will include a new 6-GW nuclear complex planned for construction in Guangdong province, and a second facility is planned for Daya Bay. The Chinese utilities solicited offers from international companies to build additional nuclear reactors, including Westinghouse who participated with a bid for its AP 1000 reactor. By 2020, China aims to have a total nuclear capacity of 40 gigawatts. This large capacity expansion will increase nuclear power from its current 1 percent to approximately 5 percent of the country's total energy requirements.<sup>51</sup>

Hydroelectricity will also increase, but this will be a smaller overall percentage of electricity generation.<sup>52</sup> China is constructing or planning many new, large-scale hydroelectric projects over the forecast period, including the 18.2-gigawatt Three Gorges Dam project, which is scheduled to be operational by 2009.

#### *Refinery capacity*

The major Chinese oil companies are also actively seeking to add to their refining capacity. CNOOC has a 240,000 bbl/d refinery project under development in the city of Huizhou in Guangdong province, which is expected to become operational in early 2008. Another current project is a \$3.5 billion expansion of the Quanzhou refinery in Fujian, which will raise its capacity from 80,000 bbl/d to 240,000-bbl/d. ExxonMobil and Saudi Aramco signed a contract with Sinopec for the project in July 2005. In addition, Saudi Aramco and Sinopec have agreed to build a refinery in Quanzhou that would process heavy Saudi crude oil. CNPC also is planning a major expansion of the Dushanzi refinery in Xinjiang, which will be partially supplied by the new pipeline from Kazakhstan. A major issue for the Chinese downstream sector is the lack of adequate refining capacity suitable for heavier Middle Eastern crude oil, which will become a necessity as Chinese import demand rises in the mid-term future. Several existing refineries are being upgraded to handle heavier and more sour grades of crude oil. With consumption of petroleum products rising so rapidly, interest in the construction of more modern green-field refineries has rekindled.<sup>53</sup>

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<sup>50</sup> "China to Speed up Nuclear Power Construction," *Peoples Daily Online*, November 2, 2004. [http://english.people.com.cn/200411/09/eng20041109\\_163186.html](http://english.people.com.cn/200411/09/eng20041109_163186.html).

<sup>51</sup> China Country Analysis Brief, EIA 2005.

<sup>52</sup> Ibid.

<sup>53</sup> Ibid.

### 3. Strategic Petroleum Reserve

After a decade of consideration, China included in its 10<sup>th</sup> five-year plan (2000-2005) the task of building strategic oil reserve. In 2004, China unveiled plans to construct Strategic Petroleum Reserve (SPR) to hold state-controlled stocks of crude oil at the following four sites: Dalian, Huangdao (Qingdao), Zhenhai, and Zhoushan (Ningbo). China has expressed the intention to build stockpiles equivalent to 90 days of imports, per the standard followed by members of the International Energy Agency (IEA) even though China is not a member. How quickly this goal can be reached, however, is uncertain. The initial phase of stockpiling in China involves building 100 million barrels of crude storage tanks. China hoped to complete this phase within two years, but delays are expected in light of today's high crude prices. A mix of government and private stocks is foreseen, with a mix of crude and products. Government stocks will come first, with private stocks waiting until regulations can be promulgated on their use.

China will finance these reserves with a mix of taxes and borrowing. A tax of 0.04 yuan per liter or about US\$0.02 per gallon of oil has been proposed to fund construction and maintenance of reserve facilities and the purchase of crude oil to fill them. Initially, however, 10% of the funding for the construction of reserve facilities will come from government budget allocations and 90% from bank loans. The loans and budgetary disbursements will be made to the NDRC's Office of Strategic Oil Reserves.

### C. Securing Foreign Energy Sources

Not only has China responded to its growing need for energy through domestic policies, but it also has sought to enhance energy security by diversifying its energy supply through imports and by acquiring overseas assets.

#### 1. Diversify Geographic Distribution of Energy Imports

As recently as 1996 China imported roughly half of its oil from two countries – Oman and Indonesia – and a total of 70% of its oil from only three countries (Oman, Indonesia and Yemen). By 2003, China had developed significantly more diverse import sources, including Saudi Arabia (16.8% of total imports), Iran (13.8%), Angola (11.2%), Oman (10.3%), Yemen (7.7%) and Sudan (4.7%).<sup>54</sup> Analysts expect this diversification to continue, with a dramatic decrease in the percentage of imports from the Asia-Pacific region and an increase in the percentage of imports from Russia and Central Asia.

The Chinese government has also sought to secure and diversify its energy supply through the construction of pipelines to transport oil from Russia and Kazakhstan. It hopes that these pipelines will help diversify supply away from Middle East and Africa, and provide for more secure transport routes, avoiding sea lane choke points, such as the Strait of Malacca. Construction of a 1,300-kilometer Kazakhstan-China pipeline from Atasu in Kazakhstan to Alashankou in Xinjiang Province, China, was launched in September 2004, and was completed in mid December 2005. It is expected to start operation in May 2006 with an initial annual capacity of 10 million tons of oil and a full

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<sup>54</sup> Data prepared by FACTS Inc. for U.S. Department of Energy, 2003.

annual capacity of 20 million tons of oil from Kazakhstan to China. In addition, the Russia-China pipeline is projected to be completed in 2008. This pipeline is actually a part of a larger pipeline that will eventually reach Nakhodka, Russia. This section will run from Taishet to Skovorodino in Russia, near the Russia-China border. The pipeline will have a capability of carrying 30 million metric tons of crude oil annually, of which 20 million will go to China.<sup>55</sup>

## 2. Overseas Assets and Investments

In recent years, the Chinese have significantly increased the number and geographic distribution of energy assets and investments, although total overseas oil investments by Chinese firms remain small compared to investments by the international oil majors.<sup>56</sup> Chinese national oil companies have invested in oil ventures in over 20 countries with bids for oilfield development contracts, pipeline contracts, and refinery projects in Iran, Sudan, Kazakhstan, Kuwait and others. In addition, the Chinese have recently focused on broadening their equity stakes in North Africa, Central Asia, Southeast Asia, Latin America and most recently in North America, where they have acquired stakes in Canadian oil sands firms and unsuccessfully attempted to acquire the U.S. firm Unocal.

In addition, China has also pursued a similar equity strategy regarding natural gas imports through upstream equity stakes in LNG projects that will bring LNG to China — particularly from Indonesia by late 2007.<sup>57</sup> The Chinese have also invited state-oil-companies in key exporting countries to invest in downstream oil and petrochemical projects in China, such as the joint refining investment in Fujian province with Saudi Aramco and ExxonMobil mentioned above. Sinopec has a 50% equity stake in the joint venture, known as the Fujian Refining Ethylene Joint-Venture Project, while Aramco and ExxonMobil will each own 25%.<sup>58</sup>

Tables 3.2 – 3.5 below list a wide range of international Chinese investment and commercial activities. These include, but are not limited to, direct overseas equity investments. Also included below are short and long-term purchase contracts for oil or natural gas, investments in pipeline infrastructure and contracts/agreements for joint ventures and exploration. All of these activities contribute to China's strategy for energy security by increasing access to overseas resources.

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<sup>55</sup> People's Daily Online, "Russian Taishet-Nakhodka pipeline to reach China first" [http://english.people.com.cn/200509/08/eng20050908\\_207413.html](http://english.people.com.cn/200509/08/eng20050908_207413.html), accessed October 20, 2005.

<sup>56</sup> Herberg, Mikal, "Asia's energy Insecurity, China, and India: Implications for the U.S." From the hearing at the Committee on Foreign Relations on July 26, 2005.

<sup>57</sup> Ibid.

<sup>58</sup> Sinopec press release "Joint Venture Partners Hold Groundbreaking Ceremony for Fujian Integrated Refining and Ethylene Joint Venture Project" July 8, 2005. <http://english.sinopec.com/en-newsevent/en-news/2621.html>.

**Tables 3.2-3.5 Key investments and commercial ties in exporting countries<sup>59</sup>**

**Table 3.2 Central Asia and Russia**

COUNTRY	DATE	COMPANY	DESCRIPTION
Azerbaijan	June 2004	Sinopec	Signed a 25-year \$220 million deal to rehabilitate Azerbaijan's Garachukhur oilfield.
Kazakhstan	1997	CNPC	Purchased 60 percent of Aktobemunaigas Production Association for \$4.3 billion.
Kazakhstan	1997	CNPC	Purchased 51% of Uzen field for \$1.3 billion.
Kazakhstan	March 2003	CNOOC/ Sinopec	British Gas Group announced the sale of its 16.67% interest in the Kashagan field to CNOOC and Sinopec. Subsequently, five of the six partners in the Kashagan consortium exercised their preemption rights and blocked the Chinese companies from investing.
Kazakhstan	May 2003	CNPC	Purchased a 25% interest in Aktobemunaigas Corp, increasing its total interest to 85%.
Kazakhstan	August 2003	CNPC	Acquired 35% of the joint venture Texaco North Buzachi Inc. from Nimir Petroleum. In September 2003, CNPC bought out ChevronTexaco's interests to become the sole owner of the rights to develop the field. In February 2004, CNPC conveyed a 50% stake in the project to the Canadian company Nelson Resources for \$90 million. The joint venture is now Nelson Buzachi Petroleum B.V.
Kazakhstan	Dec. 2003	Sinopec	Acquired a 50% stake in Big Sky Energy Kazakhstan for \$2.3 million. In 2004, Sinopec withdrew from Big Sky Energy Kazakhstan.
Kazakhstan	October 2004	Sinopec	Purchased \$160 million worth of Kazakh oil assets from First International Oil Company, a small U.S. firm.
Kazakhstan	Oct. 2005	CNOOC/ CNPC	Signed an MOU with KazMunaiGaz to explore the offshore Darkhan field, which is said to hold about 480 tons of fuel equivalent.
Kazakhstan	Oct. 2005	CNPC	A Canadian court dismissed a case brought by Lukoil claiming preemptive rights in CNPC's \$4.18 billion offer for PetroKazakhstan. Kazakhstan's state-owned petroleum monopoly KazMunaiGaz will get a share of the company and joint management over its Shymkent refinery in return for political approval for CNPC's offer.

<sup>59</sup> Information collected from various open-source documents.

Kazakhstan	Dec. 2005	CNPC	The 988-kilometer Atasu-Alashankou pipeline is on track for completion. It is the second and easternmost section of a three-phase pipeline that will carry oil from western Kazakhstan to Xinjiang. A 50/50 venture with KazMunaiGaz, but CNPC is responsible for sourcing oil to fill the pipe.
Russia	June 2003	CNPC	Signed a memorandum of understanding with Yukos Oil of Russia for sales of oil via a pipeline from Angarsk to Daqing.
Turkmenistan	July 2005	China*	Signed an agreement on oil and gas cooperation; China extended a low interest loan of US\$24 million to Turkmenistan for the development of its oil and gas industry.
Turkmenistan	Recent years	China*	China extended three 12-million-dollar low interest loans to Turkmenistan for the purchase of Chinese drill rigs.
Uzbekistan	July 2005	CNPC	Agreed to a \$600 million oil venture to invest in 23 oilfields; a 50/50 partnership with state-owned Uzbekneftegaz.
Uzbekistan	Sept. 2005	CNPC	Signed agreement on the Establishment of the Investors' Consortium with Uzbekneftegaz, Lukoil, Petronas, and Korea National Oil Corp. The Consortium plans to negotiate with Uzbekistan for drafting the production sharing agreement for exploration and production of oil and gas fields in the Uzbek part of the Aral Sea. The PSA is planned to be signed in 2006.

\* Information was not available on specific Chinese actors, company or otherwise.

### 3.3 Middle East and Africa

COUNTRY	DATE	COMPANY	DESCRIPTION
Algeria	Dec 2003	CNPC	Will invest \$31 million over three years to prospect for oil and gas.
Algeria	July 2004	CNPC and Sinopec	Granted with 3 exploration blocks.
Angola	Oct 2004	Sinopec	Secured a 50% interest in Angola's block 18, set to produce 200,000 b/d by 2007.
Angola	Aug 2005	Sinopec	Secured a 30 percent share in Block 3/5 (formerly block 3/80).
Angola	2004	Sinopec	Signed a memorandum of understanding for joint refinery and offshore prospecting.
Angola	2004	Govt. of China (Chinese EXIM Bank)	Provided \$2 billion line of credit for 10,000 b/d supply.

Congo-B	March 2005	Sinopec	Two oil exploration and production blocks.
Cote d'Ivoire	December 2004	Sinopec	Became a partner in the San Pedro block.
Egypt	1998	CNPC	Signed an agreement with two Egyptian companies to form a joint-investment company.
Gabon	2004	Sinopec	Exploration of three offshore blocks; two onshore blocks.
Iran	Oct 2004	Sinopec	Signed a MOU for a 25-year \$70 billion agreement to import LNG in exchange for developing Yadavaran oilfield.
Iraq	1997	CNPC (and a consortium of others)	Signed a 22-year production-sharing contract to develop al-Ahdab field for an estimated cost of \$1.3 billion.
Libya	2004	GOC	Signed a \$300 million, 10 million barrel crude purchase.
Madagascar	Undetermined	China*	Potential for a joint venture in exploration sometime in the future.
Mali	Oct 2004	Sinopec	Obtained two exploration blocks.
Mauritania	June 2005	CNPC	Owens a 65% stake in onshore Block 20 for exploration and production; 100% share of Blocks 12, 13, and 21 for exploration.
Niger	Aug 2004	CNPC	Obtained two exploration blocks.
Nigeria	Dec 2004	Sinopec	Signed an agreement with Nigeria Petroleum Development Corp. to develop oil production in two blocks in the Niger delta (OML 64 and 66).
Nigeria	2005	PetroChina (CNPC subsidiary)	Secured a one-year supply contact, 30,000 b/d. Four oil exploration blocks reward for stake in Kaduna refinery.
Nigeria	November 2004	Sinopec	Obtained two blocks in Lake Chad Basin.
Nigeria	January 2006	CNOOC	Agreed to pay \$2.3 billion for a 45% working interest in Nigerian Oil Mining License (OML) 130 from South Atlantic Petroleum
Saudi Arabia	Mar 2004	Sinopec	Signed a \$300 million gas exploration and production deal with Saudi Aramco.
Sudan	1997	CNPC	Acquired a 40% stake in the Greater Nile Petroleum Operation Company consortium to explore and develop the Heglig and Unity fields.
Sudan	1999	CNPC	Heglig-Port Sudan Pipeline (500,000 bpd) - A pipeline from the fields to the Red Sea.
Sudan	June 2000	CNPC	Khartoum refinery, 70,000 bpd.
Sudan	June 2004	CNPC	Adar/Yale fields, 300,000 b/d by 2006.
Sudan	September 2005	CNPC	Offshore exploration and production of block 15,



Sudan	December 2004	Sinopec	Adar-Port Sudan Pipeline.
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\* Information was not available on specific Chinese actors, company or otherwise.

### 3.4 Asia Pacific

COUNTRY	DATE	COMPANY	DESCRIPTION
Australia	Aug-02	CNOOC	Paid \$348 million for an interest in Australia's North West Shelf LNG project.
Australia	Oct-03	CNOOC	Bought a 12.5% (\$8.5 billion) share in Gorgon liquefied natural gas field off the coast of Western Australia.
Australia	Dec-04	Guangdong Dapeng LNG <sup>60</sup>	Signed a purchase agreement to buy 3.3 million tons a year for 25-years, total of \$14 billion.
Indonesia	2004	PetroChina	Has a 25% interest in, and operates, Sukawati oilfield.
Indonesia	1993 / 1995	CNOOC	Purchased 32.5% interest in an oil field in the Straits of Malacca, and an addition 6.93% in 1995.
Indonesia	Jan-02	CNOOC	Bought Indonesian assets of Repsol-YPF for \$585 million.
Indonesia	2002	CNOOC	Acquired 12.5% interest in the Tangguh LNG project in Indonesia for \$275million.
Indonesia	Sept-02	CNOOC	A 25-year to supply of \$8.5 billion worth of LNG from Tangguh in Papua province to China's Fujian province.
Indonesia	2004	CNOOC	Increased share of Tangguh to 17%, purchased additional share for \$100 million from BC Group Plc.
Indonesia	Apr-03	PetroChina	Purchased a 45% interest in an operator-ship in an Indonesian field.
Myanmar	2004	Sinopec and CNOOC	Awarded with four exploration blocks.

### 3.5 The Americas

COUNTRY	DATE	COMPANY	DESCRIPTION
Brazil	Sept-2004	Sinopec	Deal to build a \$1.3 billion gas pipeline.
Canada	1992-1993	CNPC	Purchased nearly \$11 million worth of Canadian reserves.
Canada	Apr-05	CNOOC	Paid \$122 (C\$150 million) for a 16.7% interest in Canadian oil sands company MEG Energy Group.
Canada	May-05	Sinopec	Agreed to purchase 40% interest in Synenco Energy Inc.'s Northern Lights oil sands project for \$83 million (C\$105 million).
Cuba	Jan-05	Sinopec	Signed a joint exploration agreement and production agreement signed with Cubapetroleo Enterprise.

<sup>60</sup> A group made up of 11 organizations headed by the Chinese government-owned China National Offshore Oil Corp.

Ecuador	Sep-05	CNPC / Andes Petroleum	Paid \$1.42 billion for EnCana oil and pipeline holding.
Peru	1993	Sapet Development Co. (a subsidiary of CNPC)	Bought the Talara Block for \$25 million.
Venezuela	2005	CNPC	Signed an agreement to exploit the Zumano oil fields in Eastern Venezuela.
Venezuela	1997	CNPC	Bought two marginal fields for \$359 million, purchased a field in the Intercampo Norte for \$188 million and the Caracoles Block for \$241 million.

In terms of sheer value and volumes, China's overseas petroleum investment is limited. Between the early 1990s, when CNPC began investing in Canada and Peru on small scales, to early 2005, China's cumulative overseas investment in oil and gas supply was \$7 billion, averaging less than \$600 million a year. The total equity oil secured mainly by CNPC/PetroChina, and to a lesser extent CNOOC, is around 400 thousand b/d at present, equivalent to roughly around 15% of China's total crude imports, 11% of China's domestic oil production, 6% of China's current oil consumption, 2% of current U.S. oil consumption, and less than 0.5% of global oil production. By comparison, U.S. energy analysts estimate that the overseas equity oil of the three largest U.S. companies (ExxonMobil, Chevron, and ConocoPhillips) is 3.9 mmb/d, 35% of total U.S. imports and 71% of total liquid production for the three companies.<sup>61</sup> Judged from this perspective, the impact of China's overseas petroleum investments on the global energy markets is limited.

In the United States, and among China's neighbors, there is concern about the economic impact of China's energy policies. Attention has tended to focus on investments by Chinese oil companies in energy assets such as oil and gas fields and in foreign companies that own such assets. The concern is that these actions will "remove" energy resources from the competitive market, which, according to some, has the effect of constricting supply and thereby raising world prices. However, because China can be expected to consume the vast majority of such resources, the effects of these purchases should be economically neutral. Even if China's equity oil investments "remove" assets from the global market, in the sense that they are not subsequently available for resale, these actions merely displace what the Chinese would have otherwise bought on the open market. Regardless of whether China secures its oil through equity investments or purchases on the global market, its increasing demand for these resources will continue to play a role in world oil markets (as will rising demand from other areas, such as the U.S. and India).

China has also sought to develop resources in locations, such as Sudan, where most private commercial interests are unwilling to invest. As such investments might otherwise

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<sup>61</sup> Figures taken from an analysis prepared by PIRA Energy's Global Political Risk Service.

remain outside of the reach of private sector energy companies, these actions may actually enlarge the total global oil supply.

These activities nonetheless pose a series of potential problems for the United States. In countries like Uzbekistan, Sudan, and Burma, China has openly supported regimes whose human rights violations, support for terrorism, or proliferation activities have engendered worldwide opposition. As a long-term trend, China's behavior in this respect runs counter to key strategic goals of the United States. Support for the spread of democracy and free trade has long been a central plank of U.S. foreign policy. China's tolerance for despotic regimes may undermine those efforts. Further, if Chinese companies increase their ownership of assets in these countries, this may increase China's propensity to intervene in order to protect its investments.

### 3. Territorial Disputes in Maritime Regions Surrounding China

At various times in the recent past China has clashed with virtually every single one of its neighbors over a boundary or other territorial issue. In certain cases, such as the South China Sea and the East China Sea described below, these disputes involve claim over significant natural resources.

#### *The South China Sea*

China has argued for an exclusive claim to much of the South China Sea and has been involved in disputes with Malaysia, the Philippines, Taiwan, Vietnam and Brunei because China has stated its exclusive claim to almost the entire region.<sup>62</sup> China claims "indisputable sovereignty" over the Spratlys and Paracel Islands, which are speculated to have as much as 105 billion barrels of reserves.<sup>63</sup> However, the Spratlys are also claimed wholly or in part by Taiwan, Vietnam, Malaysia, the Philippines and Brunei, and the Paracels by Vietnam. China, Vietnam, and the Philippines have significant military presence on the islands, and in 1988, the Chinese and Vietnamese navies clashed briefly over these territories. (Periodic tensions have flared between China and the Philippines, as well over China's occupation of Mischief Reef in the Spratly Island Group (1995, 1998).<sup>64</sup> China also claims sovereignty over parts of the Natuna islands, which, according the UN Convention on the Law of the Sea (UNCLOS), are part of Indonesia's "exclusive economic zone (EEZ)."<sup>65</sup> The Natuna's natural gas reserves are among the largest in the world, estimated at 210 trillion cubic feet. In addition, the Philippines' Malampaya and Camago gas fields and Malaysia's offshore fields near Sarawak are located on territories under Chinese claim. However, China has not specifically objected to the development of these fields.<sup>66</sup>

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<sup>62</sup> Daly, John, "Energy Concerns and China's Unresolved Territorial Disputes." Published by the Jamestown Foundations, [http://www.jamestown.org/email-to-friend.php?article\\_id=2368981](http://www.jamestown.org/email-to-friend.php?article_id=2368981), accessed October 24, 2005.

<sup>63</sup> "Country Analysis Brief: South China Sea Region" EIA, September 2003.

<sup>64</sup> CIA FACTBOOK, Spratly Islands, <http://www.cia.gov/cia/publications/factbook/geos/pg.html>.

<sup>65</sup> According UNCLOS, a country exclusive economic zone "The exclusive economic zone shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured."

<sup>66</sup> Country Analysis Brief, for South China Sea Region. EIA, September 2003.



China has begun a dialogue with the Association of Southeast Asian Nations (ASEAN) on the idea of a "code of conduct" governing actions by claimants, but progress has been slow. In general, ASEAN members have pushed for specific commitments to refrain from additional occupation of reefs or new construction, while China has favored a more vague commitment to refrain from actions that would "complicate the situation." In November 2002, China and the 10 members of the ASEAN signed a Joint Declaration on the Conduct of the Parties, which pledged to "undertake to resolve their

territorial and jurisdictional disputes by peaceful means" without "resorting to the threat or use of force."<sup>67</sup>

In March 2005, the national oil companies of China, the Philippines, and Vietnam signed a joint accord to jointly prospect for oil and gas resources in the disputed South China Sea areas.<sup>68</sup> The agreement was then ratified by the three countries, and would be put into practice "soon."<sup>69</sup>

### *The East China Sea*

China is also involved in a territorial dispute with Japan in the East China Sea. The issue centers upon the exploitation of undersea oil and gas reserves in the East China Sea that straddle what Japan says is the median line between the two countries. China, on the other hand, claims an EEZ extending 200 nautical miles from its continental shelf, does not recognize the median line and claims undisputed sovereignty over the resources in the area.<sup>70</sup> The difficulty in determining territorial claim lies in the fact that East China Sea is only 360 nautical miles at its widest point. Japan says that the boundary should be the median line between the two countries, while China says that its EEZ should extend from its continental shelf (putting it almost up against Japan's shores).<sup>71</sup> The disputed field contain an estimated 7 trillion cubic feet of natural gas and up to 100 billion barrels of oil.<sup>72</sup>

<sup>67</sup> Ibid.

<sup>68</sup> The Asia Times Online "China, Japan tug-of-war over Indochina" October 26, 2005, accessed, October 26, 2005.

<sup>69</sup> People's Daily Online "China, Vietnam agree to promote South China Sea Joint Exploration" May 7, 2005, accessed October 26, 2005.

<sup>70</sup> China continues to adhere to an excessive claim of sovereignty in its 200 nm Exclusive Economic Zone (EEZ). China asserts the right to regulate high seas freedoms and overflight in its EEZ. This claim is contrary to customary international law as reflected in the United Nations Convention on the Law of the Sea.

<sup>71</sup> Unfortunately, the UN Convention on the Law of the Sea does not give specifics on how overlapping EEZ claims should be resolved. For more detailed information on the Convention see [www.unclos.com](http://www.unclos.com).

<sup>72</sup> "Japan-China Oil Dispute Escalates" The Washington Post, October 22, 2005.

Relations between these two countries have been growing progressively tenser as both Chinese and Japanese oil companies have increased activity in the area. In July 2005, Japan granted drilling rights in the area to a Japanese company, Teikoku Oil. The company has not yet begun drilling, but when it does, the site of its drilling will be within the territory claimed by China.<sup>73</sup> In addition, the Chinese have completed construction of two drilling platforms (they lie just within the Chinese side of the Japanese proposed median line), at least one of which has started drilling, and may be close to completing a pipeline to the platform that would connect to the Chinese mainland.<sup>74</sup> The two countries have been trying to resolve the dispute through traditional diplomacy. There have been several rounds of talks, and suggestions of co-developing energy in the East China Sea, but the two sides have not reached an agreement.



**Table 3.6 – Energy-Related Territorial Disputes**

Countries Involved	Area of Dispute
China, Vietnam, Malaysia, Philippines, Taiwan, Vietnam, Brunei	Spratly Islands
China, Vietnam	Paracel Islands
China, Indonesia	Natuna Islands
China, Japan	East China Sea EEZ

#### D. Analytical Assessment of China’s Energy Policy

Documentation on the role of the government in commercial energy dealings with foreign entities—e.g., the Chinese government guidance, public statements, news reports, and academic journals—is scarce and, even if available, inconclusive. The relationship between the government and oil and gas industries in overseas asset acquisition remains highly opaque, including to what extent government policy directs overseas investment decisions by the industry. Some China analysts view the current overseas asset acquisition drive as government directed, while others speculate that Chinese companies exercise considerable discretion in choosing how much to spend where, and that the government plays the role of evaluating proposed projects and approving the action. Either way, the extent and precise nature of the role the government plays in these actions remains a major question.

<sup>73</sup> “Oil and gas in troubled waters” *The Economist*, October 6, 2005.

<sup>74</sup> “Japan-China Oil Dispute Escalates” *The Washington Post*, October 22, 2005.

Also unclear – though probable - is whether the Chinese government provides direct subsidies to the national energy companies for overseas investments (e.g., grants). The Chinese government does own a large percentage of these companies, but with the recent increased liberalization of the economy, the government largely allows market forces to control the assets of these companies.<sup>75</sup> In fact, formal subsidies to state-owned enterprises have fallen dramatically since the 1980s (from more than 6% to less than 0.2% of GDP). At the same time, the government has considerable control over the financial system and the interest rates state banks charge borrowers. Most of the banking sector is state-owned, although China is now opening to minority outside investments in line with its WTO commitments. Interest rates, which are tightly controlled by government and are very low (1-2%), are largely a reflection of the extremely high savings rate in China (about 40% of GDP). This may mean that Chinese companies can have access to favorable loan rates, although there is no evidence of direct government subsidies.

China's overseas oil and gas investments do, however, have certain atypical features when compared to the international oil majors. These include:<sup>76</sup>

- It is difficult to judge, but some analysts have said that Chinese energy investors may overspend, in comparison with other international oil companies, just to secure a contract. Chinese companies outspent rival bidders by large margins to win contracts in Venezuela and Kazakhstan, but these occurred in the late 1990s and may reflect the relative inexperience of the companies at that time in bidding on overseas leases.
- Chinese companies are prepared to go to countries that may be considered risky to major Western oil companies—for example, Sudan, or other locations currently under U.S. sanctions, e.g. Iran. This is due, in part, to the fact that there are few untapped areas for petroleum investment left in the world that are available to foreign investors and, as a latecomer, China seems pushed to invest in areas where other oil companies cannot or will not go.
- The Chinese state oil companies may have a lower hurdle rate for investments and therefore be willing to invest in resources that are unattractive to the international majors due to insufficient investment return.

Even though economic development most often leads to greater energy consumption, a full transition to a market economy will alleviate some of the energy issues that China faces today. Among other things, a market economy will create economic incentives for improvements in the efficiency of the energy distribution system in China and allow pricing mechanisms to send appropriate signals to consumers and producers of energy. In addition, because China has closely linked its currency to the U.S. dollar (and oil is traded in U.S. dollars), they have felt the full impact of oil price shocks. A revalued and freely floating foreign exchange system could serve to mitigate such adversarial impacts on the Chinese economy.

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<sup>75</sup> Anderson, Jonathan, “How to Think About China (Part 1)” UBS Investment Research, Asian Economic Perspectives.

<sup>76</sup> Wu, Kang and Tom Corcoran, October 2005.

### *Strengthening Diplomatic Relations with Exporting Countries*

Additionally, the Chinese government has been actively strengthening relationships with key exporting countries. Some examples of this are the following:<sup>77</sup>

- In February 2004, President Hu Jintao visited Egypt, Gabon, and Algeria. Following the visit, PetroChina signed petroleum investment agreements with Egypt and Algeria while Sinopec started importing oil from Gabon for the first time.
- Also in 2004, President Hu Jintao visited Kazakhstan and established a strategic partnership between the two countries through a joint communiqué. Hu's visit directly helped the two countries reach the agreement to build the Kazakhstan-China oil pipeline.
- During the visit of Premier Wen Jiabao to Russia in 2004, a key agenda item was Russia's Far East oil pipelines.
- In January 2005, China and Canada issued a "Statement of Energy Cooperation in the 21st Century," which said, "China and Canada have decided to work together to promote cooperation in the oil and gas sector, including Canada's oil sands, as well as in the uranium resources sector." The two nations will encourage their respective enterprises to expand upon their commercial partnerships.
- In April 2005, China and India pledged to cooperate on up-stream development in foreign countries, the first such agreement between these two former rivals to be reached in decades.
- In December 2005, The Organization of the Petroleum Exporting Countries (OPEC) president Sheikh Ahmad Fahd al-Sabah visited China to engage in talks regarding world energy markets and meeting China's future energy needs.

Although high-profile oil diplomacy has yielded individual contracts and projects for the state oil companies, these contracts only represent a small portion of the investments made by these companies. In most cases, the state oil companies recognized the opportunities first, initiated negotiations over the prospective investment move, and sought government approval of their investment plan and financial and diplomatic support if needed.<sup>78</sup>

In addition to state visits and high-level diplomacy, the Chinese government is also promoting bilateral ties by making soft loans and other types of assistance in countries where China has been promoting energy and other investments through state companies. In 2004, China provided a 17-year, \$2 billion oil-backed loan to the Angolan government that will be used to rebuild national infrastructure ravaged by years of civil war. The agreement provides China with crude in return for credit, and also opens the door to possible future exploration prospects.<sup>79</sup> The press release by the Angolan government describes that the agreement comes with "no humiliating conditions" and "surpasses the

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<sup>77</sup> Ibid.

<sup>78</sup> Wu, Kang and Tom Corcoran, October 2005.

<sup>79</sup> "ANGOLA: Oil-backed loan will finance recovery projects" Feb 25, 2005  
<http://www.irinnews.org/report.asp?ReportID=45688> .

contractual framework imposed on the Angolan government by European and traditional markets.”<sup>80</sup>

China has also launched closer relations with Cuba. A few months after President Hu’s visit to Havana in November 2004, where China signed a memorandum of understanding that essentially committed over \$500 million investment in Cuba, Sinopec signed an agreement with Cuba’s state-run Cubapetroleo (Cupet) to jointly produce oil in Cuba.<sup>81</sup> China has also supplied direct infrastructure development to many producer countries, undertaking such projects as port facilities in Gabon, railways in Nigeria and a metro system in Iran. With Sudan, which is among the top five oil exporters to China, Chinese state oil companies have concluded a few exploration and production contracts in recent years. Meanwhile, CNPC and other Chinese companies (non-oil) have spent over \$30 million to build schools, hospitals, bridges, and other social/economic infrastructure in exchange for a share in their energy industry and other parts of the economy.<sup>82</sup> Not all of this activity is necessarily related directly to Chinese energy security concerns, but rather could relate to a broader influence building campaign. In other cases, such as Venezuela and Iran, China has concluded separate agreements for arms sales. It is unclear to what extent these arrangements are intended to facilitate access to energy resources, nevertheless these actions raise concern for U.S. interests.

While energy was not dominantly in the foreground, China has also established, mostly through bilateral initiatives, strategic partnerships with the governments of several major export countries. These partnerships often encompass a wider range of bilateral cooperation—political, economic, security, etc—and broadening relations between the two countries. Likewise, China and the ASEAN countries recently established a Free Trade Area (FTA) and China has several other FTA’s currently under negotiation, including ones with Australia, Burma and the Gulf-Cooperation Countries (GCC).<sup>83</sup>

#### **IV. Overview of U.S. Policy and Policy Implications**

##### **A. U.S. Energy Policy as it Relates to Ensuring a Competitive Global Market**

On July 29, 2005, after four and a half years of dialogue and debate among diverse stakeholders, the United States Congress passed the Energy Policy Act of 2005. As a key producer and the world’s largest consumer of energy resources, the Act recognizes that the U.S. must play a leading role in addressing the world’s energy challenges and ensuring adequate and reliable supplies of affordable and market-priced energy. The U.S. will work to ensure our energy security by diversifying sources and types of energy.

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<sup>80</sup> Republic of Angola Press Release: March 26, 2004.

<sup>81</sup> “Background Note: Cuba”, U.S. Department of State, August 2005.

<sup>82</sup> Wu, Kang and Tom Corcoran, October 2005.

<sup>83</sup> Kong, 63.



Maintaining energy security now and in the future requires increasing energy production, diversifying energy sources, improving energy efficiency through technology, and modernizing and protecting global energy infrastructure.

Tight oil supplies in the face of rapidly growing demand have led to a tripling of world oil prices over the past three years. Not only has this already materially affecting the U.S. trade balance, but it may in the long run curb global economic growth. At the same time, many longtime traditional oil suppliers are facing declining production rates and new replacement supply is lagging. Investments are needed to unlock new supplies of oil and natural gas and to improve or prolong the lifespan of existing sources. Attractive trade and investment policies that provide access to reserves and promote the expansion of oil and gas production capacity around the world are necessary to match demand in developed and developing countries alike.

Diversification of energy supply toward alternate sources can greatly relieve pressures on markets for conventional energy sources over time, while helping to cope with growing environmental concerns. In the transportation sector, development of alternative fuels such as hydrogen (which can be produced from a variety of sources including nuclear, coal, gas, and wind or solar energy) and ethanol (which can be produced from a variety of crops such as corn, sugar cane, palm oil and plants with high cellulose content) could curb the world's growing appetite for oil while reducing greenhouse gas emissions. In the power sector, enhanced use of nuclear and renewable electricity generation, which produce virtually no air pollutants or greenhouse gases, as well as advanced coal-fired power plants which are highly efficient and from which carbon can be captured and used or stored, could also limit greenhouse gas emissions as well as demand for natural gas.

More efficient energy production and use can help to relieve market pressures and environmental concerns in much the same way as supply diversification. In foreign countries, as well as domestically, the gradual deployment of more fuel-efficient cars, modes of public transportation, as well as trucks and airplanes can reduce growth in world oil demand, thereby relieving pressure on world oil prices and limiting growth in carbon emissions. Abroad, as well as at home, the use of more efficient equipment and appliances can reduce growth in demand for both power and the natural gas from which a growing share of electricity is generated. More efficient power plants and industrial factories also limit oil and gas use and carbon emissions. By helping countries create policies that encourage the deployment of clean energy technologies, as well as by cooperating in the development of such technologies, we can achieve more rapid introduction of these technologies into commercial use.

The protection and enhancement of the global energy infrastructure has several major dimensions. It involves defending the free flow of oil and gas supplies around the world, over pipelines and sea lanes. It involves maintaining a robust emergency response posture to deal with oil supply disruptions, as both a deterrent to and a response to such disruptions. It involves strengthening, expanding, and protecting the infrastructure of pipelines, terminals and transmission lines over which oil, gas and power are transported.

This also has non-proliferation aspects that significantly bridge into the national security arena.

### B. Relationship between the U.S. and China as it Relates to Cooperative Pursuit of Energy Interests

The Department of Energy's engagement with China dates back to immediately after the normalization of diplomatic relations between the U.S. and China on January 1, 1979. Much of the cooperation between the U.S. and China has focused on science and technology exchanges, exchange of scientists, training, demonstration programs, and collaborative visits. Both bilateral engagements and multilateral engagements are viable means for the U.S. government in our effort to minimize potential conflict and confrontation over energy interests. These engagements are important for building capacity for consultations in emergencies, and improving understanding of each other's policy rationale and priorities. Under the current Administration, the U.S.-China Energy Policy Dialogue, the U.S.-China Oil and Gas Industry Forum, the U.S.-China Economic Development and Reform Dialogue, the Peaceful Uses of Nuclear Technologies Agreement, and the Joint Coordinating Committee on Science and Technology are key bilateral engagement vehicles that cover energy.

#### *The U.S.-China Energy Policy Dialogue*

In May 2004, then-Secretary of Energy Spencer Abraham signed a Memorandum of Understanding on the establishment of the United States-China Energy Policy Dialogue (EPD) with China's NDRC. Recognizing the importance of increasing engagement between the two top consuming nations, the U.S., through the Department of Energy, and China, through its National Development Reform Commission, launched this new bilateral initiative to facilitate policy level discussions on a range of energy issues, including energy policy making, supply security, power sector reform, energy efficiency, renewable energy, and energy technology pursuits. The Energy Policy Dialogue emphasizes that the U.S. and China share many common challenges and opportunities as the two largest energy consumers in the world and aims to promote greater cooperation to address concerns.

Through the Energy Policy Dialogue, the Department specifically aims:<sup>84</sup>

- To exchange views with China on each side's views of current and future national and international energy markets;
- To better assess the impacts of China's energy policies on U.S. energy security;
- To offer relevant U.S. experiences (positive and negative) in energy and related environmental policies and regulations to assist Chinese energy economic and environmental policy makers as they develop and revise their policy, legal and regulatory framework;
- To mitigate the environmental affects of China's rising fossil energy consumption; and

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<sup>84</sup> Memorandum of Understanding for U.S.-China Energy Policy Dialogue.

- To assess trade and investment opportunities in each other's energy markets.

The first EPD meeting was held successfully at DOE headquarters on June 30, 2005. The 13-member Chinese delegation was led by Minister Zhang Guobao, Vice Chairman of the National Development and Reform Commission. After Secretary of Energy Samuel Bodman joined Zhang in opening the meeting, DOE's Karen Harbert, Assistant Secretary for Policy and International Affairs, chaired for the U.S. side. Informative presentations and active discussions covered areas of mutual concern such as supply security and domestic energy market forecast, and topics of immediate concern like electricity transmission grid expansion, increasing energy efficiency and deploying renewable energy technologies.

#### *The U.S.-China Oil and Gas Industry Forum*

The U.S.-China Oil and Gas Industry Forum serves to expose the Chinese to western business customs as well as open the Chinese market to U.S./western investment. This Forum, launched in 1998, serves to facilitate opportunities for government and industry leaders from both countries to have frank discussions about our respective needs in the oil and gas sector. U.S. industry is already the largest investor in China's petroleum sector and continues to seek greater investment opportunities there. The Departments of Energy and Commerce are co-hosts of the Forum on the U.S. side, and the National Development and Reform Commission (NDRC) is the Chinese host. Industry representatives play a very active role in formulating meeting agendas and giving presentations. The Sixth U.S.-China Oil and Gas Industry Forum met in New Orleans, Louisiana, June 28-29, 2005. Deputy Secretary of Energy Clay Sell gave keynote remarks. The Chinese government delegation was led by Minister Zhang Guobao, Vice Chairman of the NDRC. In all, more than 30 delegates from China attended. They represented the NDRC, PetroChina, Sinopec, CNOOC, SinoChem, and China United Coalbed Methane Corporation. Key topics included deep water/off-shore development; coal bed methane production; U.S. participation in China's upstream activities; LNG infrastructure development and prospects; and risk management issues for large energy infrastructure projects in China. Both sides reaffirmed interest in seeing the development of an efficient, reliable and well-supplied global LNG market.

Additionally, the U.S. side stressed the need for an effective, transparent reporting system to ensure that the market mechanisms are working as intended: to maintain the balance between supply and demand and to provide potential investors with accurate and reliable information for use in the decision making process.

#### *U.S.-China Economic Development and Reform Dialogue*

The State Department initiated this Dialogue in 2003 with the Chinese National Development and Reform Commission (NDRC), China's premier economic development agency. The NDRC takes the lead in broad macroeconomic policy making and is involved in virtually every key sector of the economy. Through the Dialogue—which is flexible and informal in format—the U.S. has sought to move China toward a more market-oriented and rules-based economic system. The discussions have focused on long-term structural reform challenges. The NDRC places a high priority on the

Dialogue, and has recently initiated similar dialogues with the EU and the UK, among others.

The State Department held three sessions beginning in 2003 covering a wide range of topics, including energy, agriculture, macroeconomic policy, investment, and telecommunications. Former Under Secretary for Economic Affairs Al Larson was the U.S. delegation lead, with relevant senior officials from other agencies also participating. As successor to this vehicle, under the leadership of Deputy Secretary of State Robert Zoellick, the State Department has established the “Senior China Dialogue,” which has met twice since summer 2005. The last session took place in Washington, DC, December 7-8, 2005 and was chaired by Deputy Secretary Zoellick and Under Secretary for Economic Affairs Josette Shiner.

#### *U.S.-China Defense Consultative Talks*

In April 2005, at the Seventh U.S.-China Defense Consultative Talks, then-Undersecretary of Defense for Policy Douglas Feith held an in-depth discussion with his counterpart Deputy Chief of the General Staff General Xiong Guangkai on global energy security issues. The U.S. side presented a briefing on the history of global energy markets and the tendency for market correction to take place over time rendering long-term supply contracts less economically efficient.

#### *Science and Technology Cooperation*

Since 1979 DOE and the Chinese government agencies have been cooperating in the areas of high energy physics (HEP); fusion, fossil energy; energy efficiency and renewable energy; energy information exchange; Peaceful Uses of Nuclear Technologies (PUNT); and clean energy development for the 2008 Summer Olympics Games. Through this cooperation, DOE’s objectives are as follows:

- Accelerate development and deployment of new technologies, while reducing costs, through S&T cooperation and information exchange;
- Promote clean and advanced technologies to help China meet its energy and environmental challenges;
- Positively influence China’s nuclear nonproliferation policy, export control, nuclear material security and nuclear safety; and
- Facilitate U.S. industry’s investment in and trade with China.

DOE’s S&T cooperation with China has resulted in many success stories. For instance, in March 2005, China’s National People’s Congress passed legislation calling for the government to adopt an array of policies that encourage the development and use of wind, solar, geothermal, and small-scale hydroelectric plants. Staff at DOE/Lawrence Berkeley National Laboratory (LBL) and DOE/National Renewable Energy Laboratory (NREL) have invested significant amount of time to help draft the “Green Power Law.” Additionally, in 1997, with assistance from LBL, China passed “The Energy Conservation Law,” which was later enacted in 1998.

### *Peaceful Uses of Nuclear Technology (PUNT)*

In June 1998, DOE and China's State Development Planning Commission (SDPC, since renamed the National Development and Reform Commission--NDRC) signed the five-year PUNT Agreement. However little activity was initiated under the Agreement, partially due to allegations that information on sensitive technologies was being diverted. In June 2001, then-Secretary Abraham received a letter of invitation from Minister Zeng Peiyang, Chairman of the SDPC, to visit China and resume the PUNT dialogue. The Secretary accepted the invitation and agreed to the first meeting of the Joint Coordinating Committee (JCC) under PUNT, which took place in July 2002.

The objective of PUNT is to positively influence China on nuclear nonproliferation policy since the U.S. and PRC are parties to the Treaty on the Non-Proliferation of Nuclear Weapons and to promote various areas of nuclear energy research and development cooperation. The PUNT Agreement reaffirms the Agreement for Cooperation between the Government of the United States of America and the Government of the People's Republic of China Concerning Peaceful Uses of Nuclear Energy signed on July 23, 1985, and approved by the U.S. Congress on December 30, 1985. In October 1997, President Clinton announced his intention to implement the agreement, and on January 12, 1998, he signed the formal certifications and reports required by U.S. law to implement the agreement. The specific objective is to advance a non-proliferation agenda with China that includes the 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. To date, two Joint Coordinating Committee (JCC) Meetings, in conjunction with Workshops, took place in 2002 and 2004. Three Joint Working Groups have been established: Nuclear Energy Technology; Nuclear Security, Emergency Management, and Safety; and Environment and Waste Management. The third JCC is planned for early 2006.

### *Other Joint Activities*

The United States has sponsored several pollution control workshops in China since 2003. Over 100 representatives from China's government and industry sectors have attended to learn about the latest technological developments from U.S. vendors of emissions control equipment. Several U.S. companies received contracts for environmental control equipment following the workshop and at least one company formed a new business relationship with a Chinese company to represent them in China.

Another example of our mutually beneficial relationship with China includes a two-week training program sponsored by DOE on operations and maintenance practices for flue gas desulphurization technologies used in coal-fired power plants. Approximately 200 Chinese government officials and utility company personnel attended the training sessions in 2003. There have even been requests from the Chinese for follow-on briefings. This project has proved to be a very low-cost way to leverage work already done in the U.S. to highlight the offerings of our companies in this area of technology. China will require the installation of large numbers of flue gas desulphurization units over the next decade with an estimated value of \$10 billion. This will help position U.S.

companies to successfully compete with the already strong competition from Japanese and European vendors.

#### *Multilateral Cooperation*

China has become an active member economy in the Asia Pacific Economic Cooperation's (APEC) Energy Working Group in recent years. The APEC/EWG has hosted many workshops on timely energy issues in recent years, including on liquefied natural gas best practices. In July 2005, DOE hosted a workshop on oil stockpiling under the auspices of the APEC Energy Working Group. This workshop aimed to examine progress toward APEC best practices in those economies (like China) that have already chosen to establish strategic stockpiles, as well as to encourage new commitments by economies that have not yet decided to establish such strategic stockpiles. The workshop served as an important opportunity for the USG to reiterate key principles of SPR management and discourage the use of stockpiles for price manipulations. China has also participated in APEC Energy Ministers Meetings, the last (the 7<sup>th</sup>) of which was held in Korea in October 2005.

The United States is also engaged with China through multilateral fora, including the International Energy Agency (IEA), of which the U.S. is a founding member. Although China is not member of the IEA, key Chinese officials have been invited to IEA Ministerial meetings in recent years. NDRC Vice Chairman Zhang Xiaoqiang addressed the most recent Ministerial in May 2005. DOE has been a key participant at workshops on natural gas and strategic petroleum stocks, among others, held in China by the IEA to assist the government of China in reforming and opening the gas sector and in deciding to create a national strategic oil reserve. For example, through the IEA workshop on natural gas as well as bilateral technical assistance, DOE encouraged the Chinese government to create or improve a legal framework, price regulation and taxation scheme for the natural gas sector, and advised them in addressing technical challenges as China has embarked upon a major expansion of its gas infrastructure. One result was a significant opening to foreign investors when China constructed its 4200-kilometer West-to-East Gas Pipeline.

The U.S. and China are also working together through the International Partnership for a Hydrogen Economy (IPHE), which the President envisages as helping to bring hydrogen-based vehicles to market worldwide. Another potentially transforming technology is the focus of the Department's Carbon Sequestration Leadership Forum (CSLF). Given their potential technical contributions as well as the importance of their future markets, the Chinese have been important partners in these two initiatives. China has been an active member of the CSLF and the IPHE since their inception. For example, China hosted the IPHE Steering Committee meeting in May 2004 in Beijing, and has offered to host the IPHE Implementation-Liaison Committee meeting in October 2005 in Shanghai.

#### *Other efforts*

The Department of Energy recently opened an office in Beijing, China. The office, which was announced by Secretary Bodman on June 30, 2005, will allow the Department to seek opportunities to better assess the impacts of China's energy policies on U.S.

energy security, positively affect Chinese energy and economic policymaking, as well as advance commercial opportunities for U.S. industry.

## **V. Cross-Country Comparison of Laws and Regulations**

The study below offers a comparison of the applicable laws and regulations of an illustrative group of nations to determine whether a United States company would be permitted to purchase, acquire, merge, or otherwise establish a joint relationship with an entity whose primary place of business is in that nation. It includes an analysis of the laws and regulations of the People's Republic of China within the context of other major energy producing countries from various regions throughout the world. The sampling of countries selected for comparison represent countries that are important producers/exporters of oil and natural gas resources from developed and developing economies with different approaches to governing foreign investment in their domestic oil and gas sector. The sampling is intended to provide an overview of the variety of legal and regulatory frameworks encountered by U.S. companies looking to do business in a number of major oil and gas sectors.<sup>85</sup>

Companies seek to invest in oil and gas sectors around the world, not only by purchasing domestic energy firms, but also by purchasing a stake in exploration and production activities, entering into joint venture operations, participating in tender processes, financing energy infrastructure projects, operating refineries, and marketing petroleum products. Another major source of U.S. company involvement in foreign energy markets is in the service industry. For the purpose of this study, countries were examined in terms of a U.S. company's ability to purchase a local energy firm, obtain equity oil stakes, invest in refining and petrochemicals, and market petroleum products in country or elsewhere.

### Comparing Investment Climates and Commercial Frameworks

Energy investment climates differ from region to region, sometimes corresponding to the level of natural resources available in-country, and often become more or less open to foreign investment depending on the global price of oil and natural gas and the ability of the domestic (sometimes state-owned) industry to finance the sector. In the cases of China, Kazakhstan, Kuwait, Mexico, Norway, Russia, Saudi Arabia and Venezuela, the governments take different approaches to allowing foreign companies to own oil companies or resources, explore and produce the resources, refine and market the resources, or serve as service companies. It is evident that each country attempts to strike to balance between controlling the resources and attracting the necessary capital and expertise to optimize energy sector operations.

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<sup>85</sup> A more comprehensive examination of global trade barriers by country is available through the U.S. Trade Representative's office at [http://www.ustr.gov/Document\\_Library/Reports\\_Publications/2005/2005\\_NTE\\_Report/Section\\_Index.html](http://www.ustr.gov/Document_Library/Reports_Publications/2005/2005_NTE_Report/Section_Index.html).

Of the countries examined in this study, Norway is generally viewed as the most open to foreign investment in the oil and gas sector; Russia, Venezuela and Kazakhstan are viewed as less open to private foreign investment. Norway and Kazakhstan both seek to expand on foreign investment in different aspects of their respective oil and gas sectors, while Venezuela and Russia appear to be reasserting state control in this strategic sector. Saudi Arabia and Mexico are viewed as countries that are most restrictive in terms of foreign ownership. A brief overview of current U.S. company involvement in the energy sector of each country is provided in Appendix B.

The Norwegian oil and gas sector is open to foreign investment and guidelines for foreign companies to become involved in the sector are relatively clear. While there are no direct examples of a U.S. company purchasing a Norwegian energy production firm, other foreign private companies have done so in the past. Norway's largest operating petroleum companies, Statoil and Norsk Hydro, are both partially state owned (majority and minority respectively) and the sale of those shares is a government of Norway (GON) decision. U.S. companies have a long history in Norway and, in fact, made the first discoveries of oil on the Norwegian Continental Shelf and drove the early development of Norway's offshore resources. They continue to be major participants and investors. The remaining resources on the Norwegian Continental Shelf (NCS) are gradually becoming more difficult to produce, both technologically and commercially. An overall objective of the Norwegian oil and gas policy has been to ensure that the largest possible share of value creation from the petroleum operations benefits the Norwegian community. Given the technical difficulty of operating in Norway and despite a large number of equipment suppliers in a very selective market, Norway continuously seeks new and proven technology for exploration and field developments in deep and remote northern waters. Close contact between the various Government agencies and the oil and gas industry has been important for the development of activities on the NCS.

Kazakhstan's law on investments provides equal rights to both domestic and foreign investors. U.S. investors in the energy sector are subject to the same regulatory barriers and obstacles faced by all investors. In addition, U.S. investors enjoy protections under the U.S.-Kazakhstan Bilateral Investment Treaty (BIT). Subsurface users are required to conclude individual contracts with the government. Commercial terms differ according to the type of contract differentiating between a tax-royalty subsurface use contract and a production sharing agreement. Subsurface users in Kazakhstan are obligated to purchase goods (work and services) from Kazakhstan entities (provided they meet minimum project standards) and to give preference to the employment of local personnel. Anticipated utilization of local workers, goods, and services is required for any company entering into a tender process for subsurface work. The law also requires that tender proposals specify a commitment to infrastructure projects and the economic and social development of the relevant regions of the country.

The Russian commercial framework allows foreign investment in the energy sector. However, Russia's energy sector has been consolidated and, to some extent, reverted to state control. Foreign companies have raised concerns about Russia's adherence to rule of law, transparency, respect for contract sanctity, onerous tax regime, administrative



barriers, and an overall atmosphere of uncertainty. The Russian government has made efforts to diversify its economy away from commodity exports by channeling commodity revenues into targeted sectors. However, this goal is not being pursued vigorously. Russian policy makers continue to exhibit an inclination to advance the state's influence in the energy sector, particularly through state control of infrastructure and tax and regulatory policies. In mid-February 2005, the Russian government announced its intention to limit foreign company participation in tenders to develop *strategic* oil, metals, and mineral resource deposits, but the Russian Government has still not defined what strategic oil is or where it is located. These new rules should not extend to contracts already signed, or to smaller fields, which make up 90% of the licenses in the state reserve fund. The current legislative debate in Russia centers on: energy taxation, subsoil use amendments, investment incentives, and specifying ownership restrictions for foreign companies that take part in tenders for strategic fields.

In Venezuela, U.S. companies can participate in joint ventures (JVs) with the Venezuelan state oil company, PDVSA, and can obtain equity oil and invest in refining but only under certain circumstances. U.S. companies can purchase private Venezuelan companies, but these companies can only produce oil under the same JV restrictions that foreign companies face. There are extensive U.S. investments in strategic associations in heavy oil, in exploration and development activities in new areas, and in operating service agreements (OSAs) for pre-existing oil fields. However, recent unilateral moves by the government of Venezuela (GOV) to change the royalties and taxes on existing contracts and to require the migration of OSAs to the hydrocarbons law framework has created a great deal of uncertainty for U.S. companies investing in Venezuela. Article 57 of the 2001 Organic Law of Hydrocarbons provides that only State-oil companies have the right to commercialize natural hydrocarbons and hydrocarbon by-products. Foreign companies obtain equity oil in the syncrude projects due to the GOV's interpretation of the term "natural hydrocarbons" in which they do not include the syncrude derived from bitumen extraction and upgrade operations. On the refining side, Article 10 of the 2001 Organic Law states that private companies may refine and commercialize natural hydrocarbons. The ability of foreign, including U.S., companies to market petroleum products is unclear, because Article 10 also subjugates itself to Chapter VIII of the Organic Law, which includes Article 57. There is, however, limited participation by U.S. firms in the petroleum product marketing system. If the term "by-products" in article 57 is interpreted to include refined products, then private companies can participate in the running of refineries but not market the refineries' products. The Gas Hydrocarbons Law allows private operators to own 100% of non-associated projects, a sharp contrast to the ownership rules in the oil sector. Furthermore, royalty and income tax rates on the non-associated natural gas projects, 20% and 30% respectively, are much lower than corresponding rates for oil projects. Discussions on a possible Bilateral Investment Treaty with Venezuela were held as recently as 2001, but did not advance.

While Saudi Arabia does not allow foreign companies to take part in many aspects of its oil and gas sector, it does provide a great deal of opportunity for foreign investment in petrochemicals and the service sector and recognizes the need for increased investment in the coming years. Saudi Arabian regulations currently close oil exploration, drilling, and

production to foreign investment. However, in October 2003, Saudi Aramco formed a joint venture with two international oil companies (IOCs) to form the South Rub-Al Khali Company (SRAK), to explore, develop and produce non-associated gas in the south Rub' al-Khali (Empty Quarter). Prior to this agreement, the Saudi Gas Initiative (SGI) was promoted to develop three “core ventures” in the Saudi gas sector. Core Venture One (CV1) was in South Ghawar, CV2 was in the Red Sea region, and CV3 was in the Empty Quarter. Even though the overall SGI ran into problems, smaller projects were pursued. Each contract stipulated that the recipient would form an exploration-and-production-company jointly with Saudi Aramco, with the latter holding a 20% share of each. In addition, Saudi Arabia does hire foreign drilling rig operators and oil field contractors. Some 70 drilling rigs are now operating in the kingdom, up from 55 in 2004 and about 20 in the mid-1990s. The national oil company, Saudi Aramco, conducts all national oil exploration and development with the exception of one longstanding concession in the Saudi-Kuwait Partitioned Neutral Zone. U.S. investment in the oil field services sector is significant and investments are likely to expand. Saudi Arabia’s WTO Accession should provide a level playing field for U.S. company involvement in oil and gas services in exploration, development, pipeline transportation, and management and consulting. The Saudi Arabian General Information Authority issued a report stating that one hundred billion USD in foreign investment in the Saudi downstream sector will be required over the next twenty years to meet growing demand for refined petroleum products and petrochemicals. Outside the service sector there is no specific commercial framework in place for U.S. or other foreign company involvement in the development of oil resources. For investment in the downstream sector, the general framework for foreign investment applies. The standard tax rate for business income earned by non-Saudi entities is twenty percent under Saudi law, but there are higher tax rates for businesses engaged in natural gas investment (thirty percent) and oil and hydrocarbon production (eighty-five percent). As noted, at this time, no foreign firms are engaged in the latter.

In China, a number of regulations restrict the ability of U.S. and other foreign companies to purchase, acquire, or merge with a Chinese oil company by requiring a local partner for foreign investment in key oil-related industries. Its restrictive or inconsistent measures against foreign investment often come in the form of “investment guidance,” by which the government identifies certain energy sub-sectors to encourage greater investment while effectively closing other sub-sectors to discourage investment. Chinese government pricing policies and conditions for oil products along with often-unclear policies and regulations governing energy supplies also impede the ability of U.S. and other foreign companies to engage in the domestic market. However, China’s WTO accession in 2001 and more recent energy demand drivers have led Beijing to lower some import tariffs and limit the number of non-trade barriers in selective sectors of the Chinese energy market, suggesting there may be some hope for improved market access in the future. China has long maintained tariff and regulatory trade barriers for foreign oil companies seeking to do business in China, but has moved to eliminate or mitigate some of these following its accession to the WTO and as its demand for energy has increased. For example, China no longer assesses a customs duty on imported oil and natural gas, having reduced the duty from 2% in 2002. Other explicit barriers such as licenses affect the oil sector in China to varying degrees. For example, licenses are still needed for the

import of oil, but because of greater market competition, state-owned companies no longer dominate the import trade. Meanwhile, non-tariff trade barriers are beginning to be addressed by China's national industrial and trade policies but the continued existence of these barriers creates inefficiencies and increases costs for both Chinese and foreign companies. Despite these inefficiencies and costs, Western oil and gas companies have also been playing an increasingly prominent role in China's energy sector development. Supermajors and various IOCs have purchased shares of major Chinese oil companies and U.S. majors are also active in China's offshore development operations. [See "Market Transformation" under Section 2B and Table 2.2 on "Key Feature of Oil Firms in China" for more information.]

In Kuwait, the oil industry is state-run and the Kuwait Constitution expressly forbids foreign companies from investing in the natural resources of the country. U.S. companies can neither purchase the local oil company nor obtain equity oil. There are some opportunities for investment in the refining and petrochemical sector. According to the government of Kuwait (GOK) one petrochemical joint venture in particular is the largest producer of glycol in the world. While there is no law expressly forbidding the marketing of petroleum products by foreign companies, the subsidies provided for local products make it virtually impossible for any company to profitably import petroleum products. A number of foreign oil companies, including U.S. companies have technical service contract with various elements of the GOK oil industry. By law, foreign companies may participate in service activities as long as participation is awarded by public tender; the company is represented by a Kuwaiti agent or partner; the company abides by GOK labor rules, including mandatory hiring quotas for Kuwaitis; and any disputes between the contractor and the Kuwait Oil Company fall under the exclusive jurisdiction of the Kuwaiti courts.

One major initiative underway to increase oil production capacity is Project Kuwait, a \$7 billion, 25-year plan, first formulated in 1997, to increase the country's oil production (and to help compensate for declines at mature fields), with the help of IOCs. Under the plan, Kuwait is considering permitting foreign oil companies to invest in upstream production, although only through incentivised buy-back contract (IBBC) arrangements, which do not involve production sharing, concessions, or the "booking" of reserves by foreign companies. Kuwait hopes to reach capacity of 4 million bbl/d by 2020, up from around 2.5 million bbl/d at present. As mentioned above, Kuwait's constitution bars foreign investment in the country's natural resources, except as provided for by law. Unlike product sharing agreements (PSAs), the structure of IBBC agreements allow the Kuwaiti government to retain full ownership of its oil reserves, control over oil production levels, and strategic management of the ventures. Foreign firms are to be paid a per barrel fee, along with allowances for capital recovery and incentive fees for increasing reserves, in their role as service provider/contractor. Under Project Kuwait, international oil companies would not be permitted to retain a Kuwaiti agent. The fields which the Kuwaiti government intends to open to foreign investment are all currently operating fields in northern or western Kuwait

Mexico's oil and gas policy is highly restrictive when it comes to private equity investment. Mexico remains closed to all foreign company involvement outside the LNG sector and the marketing of petroleum products. The Mexican constitution specifies state ownership of hydrocarbons and provides that no concessions or other types of production-sharing agreements or risk contracts shall be granted in regard to hydrocarbon exploitation. Article 28 of the Constitution prescribes that the petroleum industry (defined in the 1958 Petroleum Law and entrusted to state-energy company Petroleos Mexicanos (PEMEX)) is exclusively reserved to the federal government. A change in the constitution requires a two-thirds majority vote of the members present in federal legislature and approval by the majority of state legislatures. When PEMEX was established in 1938, it was given exclusive rights to explore for and produce oil and gas in the country—rights that exist to the present day. However, PEMEX does not own the oil, gas, and other hydrocarbon reserves that exist in the country; ownership resides with the Mexican nation. For many years this system of managing the hydrocarbons sector was sufficient to meet Mexican energy needs and a source of national pride. As of late, the Mexican government has explored ways to allow foreign investment and attract much needed capital without violating the constitution. This would remove some pressure from the financially burdened PEMEX. So far, the reforms efforts have had little success.

**Extent of U.S. Companies' Ability to Enter Market**

	<b>Can a U.S. company purchase local oil companies?</b>	<b>Can a U.S. company obtain equity oil?</b>	<b>Can a U.S. company invest in refining/petrochemicals?</b>	<b>Can a U.S. company market petroleum products?</b>
<b>China</b>	Chinese regulations requiring a local partner for foreign investment in key oil-related industries restrict the ability of U.S. and other foreign companies to purchase, acquire, or merge with a Chinese oil company. However, companies can buy shares in some Chinese oil companies.	Chinese government pricing policies and oligopolistic pricing conditions for oil products along with often unclear policy and regulatory framework governing energy supplies impedes the ability of U.S. and other foreign companies to engage freely in the equity market. U.S. companies, however, have seen some opportunities to obtain equity oil in remote and difficult areas where their expertise facilitates exploration and production.	Yes. However, pricing policies and unclear policy and regulatory framework governing energy supplies also impede the ability of U.S. and other foreign companies to engage in the domestic market.	Yes. However, distribution rights remain heavily guarded and a number of conditions are attached to the approval of a foreign company's bid to gain access to this market.

	<b>Can a U.S. company purchase local oil companies?</b>	<b>Can a U.S. company obtain equity oil?</b>	<b>Can a U.S. company invest in refining/petrochemicals?</b>	<b>Can a U.S. company market petroleum products?</b>
<b>Kazakhstan</b>	Yes. However, a December 2004 law gives the State a preemptive right to purchase shares in new and existing hydrocarbon projects. An October 2005 law extends the State's preemptive right to parent companies of entities holding subsurface rights in Kazakhstan.	Yes. However, a 2005 law stipulates that the state-owned oil and gas company has the right to own a 50% interest in new production sharing agreements. The State also has preemptive rights to purchase shares in any consortium.	Yes. However, as of October 2005 the government can restrict the assignment of a property right in "strategic resources" of the countries -- existing refineries are likely to be considered as such.	Yes.
<b>Kuwait</b>	No. The Kuwaiti constitution expressly forbids foreign companies from investing in natural resources.	No. The Kuwaiti constitution expressly forbids foreign companies from investing in natural resources.	Yes. There are opportunities available for investment in the refining and petrochemical sector	Yes, technically. While there is no law expressly forbidding the marketing of petroleum products by foreign companies, the subsidies provided for local products make it virtually impossible for any company to profitably import petroleum products.

	<b>Can a U.S. company purchase local oil companies?</b>	<b>Can a U.S. company obtain equity oil?</b>	<b>Can a U.S. company invest in refining/petrochemicals?</b>	<b>Can a U.S. company market petroleum products?</b>
<b>Mexico</b>	No. Foreign companies cannot purchase local oil companies.	No. Foreign companies cannot obtain equity oil.	No. Foreign companies cannot invest in equity oil.	Yes. Foreign companies can market petroleum products (lubricants and additives) and they can participate in the LNG sector.
<b>Norway</b>	Yes. U.S. companies can purchase Norwegian companies, but major Norwegian oil companies are state-controlled.	Yes. There is broad participation by U.S. companies on the Norwegian Shelf.	Yes. In fact, a U.S. company owns one of Norway's two refineries.	Yes. Several U.S. companies are marketing petroleum products in Norway. They also market their own equity oil.
<b>Russia</b>	By law, U.S. companies can buy Russian firms but bureaucratic obstacles inhibit the purchase of major oil firms.	Yes. However, pending Russian legislation will limit non-Russian participation in assets deemed "strategic."	Yes.	Yes. Examples of U.S./Russian joint venture to market product exist.
<b>Saudi Arabia</b>	No. Under current Saudi law, foreign companies cannot purchase a stake in the national oil company, Saudi Aramco.	No. With the exception of one longstanding concession in the Saudi-Kuwait Partitioned Neutral Zone, Under current Saudi law foreign companies cannot purchase equity oil.	Yes. There is no prohibition on foreign investment in refining and petrochemical development.	Yes, technically. There are no Saudi laws that expressly forbid foreign marketing of petroleum products but the subsidies allocated for refined fuels, including gasoline, sold by Aramco in the local market have the effect of pricing imported fuel products out of the Kingdom.

	<b>Can a U.S. company purchase local oil companies?</b>	<b>Can a U.S. company obtain equity oil?</b>	<b>Can a U.S. company invest in refining/petrochemicals?</b>	<b>Can a U.S. company market petroleum products?</b>
<b>Venezuela</b>	U.S. companies do not face any major restrictions on their ability to purchase private local oil companies. However, foreign companies cannot purchase a stake in the national oil company, PDVSA.	Yes. Companies may obtain equity oil in Venezuela but under limited circumstances. Recently the government has began to push all foreign companies holding an operating service agreement to migrate their contracts to joint venture contracts in which PDVSA holds a majority interest.	Yes. Companies can invest in refining but only under certain circumstances (it is unclear whether foreign companies can actually market the products they have refined).	Yes. Venezuelan law does not place limitations on downstream activities for private sector entities. However, Article 57 (the Organic Law) leaves some room for the GOV to restrict the commercialization of natural hydrocarbons and by-products to national companies at its discretion, depending on its interpretation.



## **APPENDIX A – Historical Overview of Chinese Energy Sector**

A brief history of the structural changes in the institutions governing the petroleum industry can be summarized as follows:

- Before 1955, coal, power, and petroleum were all under one ministry, the Ministry of Fuels Industry (MFI).
- 1955: China abolished the MFI and formed separate ministries for coal, electric power, and petroleum.
- 1970: the Ministry of the Petroleum Industry (MOPI) was merged with the Ministries of the Coal and Chemical industries to form the Ministry of Fuels and Chemicals (MFC).
- 1975: Coal was separated from the MFC to form the Ministry of the Coal Industry. The MFC was renamed the Ministry of Petroleum and Chemicals (MPC).
- 1978: The MPC was abolished, MOPI was restored and a new Ministry of Chemical Industry was formed.
- February 1982: China National Offshore Oil Corporation (CNOOC) was established.
- July 1983: China Petrochemical Corporation (Sinopec) was established.
- June 1988: The Ministries of the Petroleum Industry, Water Conservancy and Power, and Coal industries were abolished to form the Ministry of Energy (MOE).
- August 1988: China National Petroleum Corporation (CNPC) was established. Most of the upstream oil producing fields previously managed by the MOPI were then transferred to CNPC, which was part of the government's efforts to separate policy making and supervision from business operations.
- January 1993: CNPC and Sinochem formed the joint-venture oil trading company China National United Oil Corporation (Chinaoil).
- February 1993: Sinopec and Sinochem formed the joint venture state oil trading company China International United Petroleum & Chemicals Co., Ltd. (Unipech).
- March 1993: The MOE was abolished.
- January 1997: China National Star Petroleum Corporation (CNSPC) was established out of the old Petroleum Bureau of the Ministry of Geology and Mineral Resources.
- 1998: The State Economic and Trade Commission (SETC) was established and the State Planning Commission was renamed State Development Planning Commission (SDPC). Under the SETC, the State Administration for Petroleum and Chemical Industries (SAPCI) was formed and all government functions previously associated with CNPC, Sinopec, and CNOOC were transferred to it. Also in 1998, CNPC and Sinopec were reorganized into two vertically integrated oil companies divided along geographical lines.
- November 1999: PetroChina, a 100%-owned subsidiary (prior to its initial public offering, or IPO, in April 2000) of CNPC, was established.
- February 2000: Sinopec Corp., a 100%-owned subsidiary (prior to its IPO in October 2000) of Sinopec, was established.
- April 2000: CNSPC was merged into Sinopec and became a Sinopec subsidiary and renamed Sinopec Star Petroleum Corporation (SSPC). PetroChina also launched its IPO and was formally listed in Hong Kong and New York. Sinopec Corp. launched its IPO and was formally listed in Hong Kong, New York, and London in October 2000.

- February 2001: SAPCI, along with coal, power, and other administrations under the SETC was abolished. Meanwhile, CNOOC Ltd. launched its IPO and was formally listed in New York and Hong Kong.
- March 2003: the SETC was abolished and the SDPC was renamed the National Development and Reform Commission (NDRC), taking over many of the functions from the now-defunct SETC. Within NDRC, the new Energy Administration (EA) was formed. Meanwhile, a new regulatory body, the State-Owned Assets Supervision and Administrative Commission (SASAC) was formed.
- May 2005: China established the National Energy Leading Group (NELG) within the State Council and its supporting agency National Energy Office (NEO) within the NDRC.

## **APPENDIX B: Examples of U.S. Energy Company Involvement in Each Country**

### China

U.S. companies, despite the obstacles to majority equity investment in Chinese oil companies, have held minority stakes in Chinese oil companies and are pursuing joint venture with Chinese partners. In one instance, a U.S. company held a minority position in Sinopec in 2000, but sold its entire stake in March 2005. Outside of equity ownership, major U.S. oil companies have pursued numerous joint ventures with Chinese oil companies including \$3.6 billion dollar joint venture with Chinese partners to construct an integrated refining complex. Smaller U.S. oil companies are also achieving some access to the Chinese market through joint ventures to conduct geological surveys.

### Kazakhstan

There are no notable examples of U.S. companies attempting to purchase local oil companies in Kazakhstan. U.S. entry into the market usually occurs through a consortium of shareholders or by applying to the appropriate ministries to obtain a contract for exploration and production rights. Currently very few examples exist of U.S. company involvement in Kazakhstan's petrochemical industry which is not well developed due to Kazakhstan's distance from petrochemical markets. U.S. companies are part of joint venture consortiums in the petrochemical and refining industry, producing products for export. Kazakhstan is looking to develop the petrochemicals industry and is researching ways to develop the industry and attract foreign investment. So far the prevailing criterion for awarding tenders in the sector is a commitment to introduce "high technology" to Kazakhstan.

### Kuwait

In the petrochemical sector there is one instance in which a U.S. company has been allowed to invest in a local production facility, through a joint venture with Kuwait's state-owned Petrochemical Industries Company (IPC). The company produces polyethylene and ethylene glycol, which are marketed primarily to Asia, Europe and the Middle East. Two new petrochemical joint ventures are planned, all including investment by a U.S. company. Investments by foreign companies in a planned refinery, in the form of a joint venture, have been proposed. The Parliament is expected to vote on a contract enabling Kuwait Oil Company (KOC) to sign an Operating Service Contract with a consortium of foreign oil companies. This law would permit foreign experts to further develop and exploit Kuwait's northern oilfields. If the bill passes, KOC will present a contract document to three consortia, each of which includes a U.S. company. The consortia will bid on the contract and the winning consortium will be granted the right to operate the northern oilfields. The winning consortium will invest \$7-8 billion for development of the fields and management of the reservoirs over the lifetime of the 20-year contract. The consortium's return will be cost recovery plus a per-barrel fee. The project has been on hold for over eight years, pending Parliamentary approval.

### Mexico

U.S. companies are active in Mexico in marketing petroleum products and the LNG sector. A 1938 constitutional amendment regarding hydrocarbon ownership and subsequent investment regulations prohibit most foreign participation in the energy sector. As the lack of investment capital to access these resources has become clear, exceptions to these rules have been explored. One example is the Multiple Service Contract (MSC), through which Pemex can aggregate all the services needed to develop a gas field. MSCs are designed to bring in foreign expertise and capital without violating the constitutional ban on foreign participation in the petroleum sector.

Major U.S. oil companies have not bid actively because they see too little potential profit and these service contracts do not fit the business models of major oil companies.

#### Norway

Some 20 international oil companies are engaged in upstream activities on the Norwegian continental shelf together with now two Norwegian companies: Statoil and Norsk Hydro which are majority state-controlled. U.S. companies have a long history in Norway. They have been active in Norwegian petroleum developments since the beginning of offshore development in the North Sea, and they continue to be major participants and investors. U.S. companies have played an important role and provided valuable contributions to technology developments in Norway. The U.S. also continues to hold a strong market position in Norway. For several years, major U.S. companies have been well established in Norway and are active players in the Norwegian oil industry.

#### Russia

In the past, U.S. companies have successfully purchased Russian companies. U.S. firms have also obtained a significant stake in a Russian firm. U.S. companies are operating in joint ventures with major Russian companies or as part of international consortia. U.S. companies also play an active role in the Caspian Pipeline Consortium. Despite these positive examples of U.S. energy company investment, there are instances of investment disputes, contract nullifications, and legislative uncertainties that have precluded U.S. companies from successfully completing projects and being awarded production-sharing agreements.

#### Saudi Arabia

Saudi Aramco has partnered with U.S. companies on various refinery projects, offering to share up to 50 percent ownership. Saudi Aramco is currently engaged in selecting among several foreign bidders to join as equity partners in two new export refineries in the country scheduled for completion in 2009 and estimated to cost four to five billion USD each. Nine foreign firms – which include several U.S. firms – submitted bids to participate as equity partners in these new refineries. In addition, several international investors have formed joint ventures with the Saudi Arabian Basic Industries Corporation (SABIC), to build petrochemical plants that utilize gas feedstock from Saudi Aramco.

#### Venezuela

There is very substantial U.S. and foreign investment in Venezuela's strategic associations, which produce, upgrade and export heavy oil reserves. There is widespread U.S. and foreign participation in some 33 Operating Service Agreements to produce oil from existing fields, and U.S. and other foreign firms have won rights to development of new exploration and production areas.

## **APPENDIX C: Text of Section 1837 of The Energy Policy Act of 2005**

### **SEC. 1837. NATIONAL SECURITY REVIEW OF INTERNATIONAL ENERGY REQUIREMENTS.**

(a) **STUDY.**—The Secretary, in consultation with the Secretary of Defense and Secretary of Homeland Security, shall conduct a study of the growing energy requirements of the People’s Republic of China and the implications of such growth on the political, strategic, economic, or national security interests of the United States, including—

(1) an assessment of the type, nationality, and location of energy assets that have been sought for investment by entities located in the People’s Republic of China;

(2) an assessment of the extent to which investment in energy assets by entities located in the People’s Republic of China has been on market-based terms and free from subsidies from the People’s Republic of China;

(3) an assessment of the effect of investment in energy assets by entities located in the People’s Republic of China on the control by the United States of dual-use and export controlled technologies, including the effect on current and future access to foreign and domestic sources of rare earth elements used to produce such technologies;

(4) an assessment of the relationship between the government of the People’s Republic of China and energy-related businesses located in the People’s Republic of China;

(5) an assessment of the impact on the world energy market of the common practice of entities located in the People’s Republic of China of removing the energy assets owned or controlled by such entities from the competitive market, with emphasis on the effect if such practice expands along with the growth in energy consumption of the People’s Republic of China;

(6) an examination of the United States energy policy and foreign policy as it relates to ensuring a competitive global energy market;

(7) an examination of the relationship between the United States and the People’s Republic of China as it relates to pursuing energy interests in a manner that avoids conflicts; and

(8) a comparison of the appropriate laws and regulations of other nations to determine whether a United States company would be permitted to purchase, acquire, merge, or otherwise establish a joint relationship with an entity whose primary place of business is in that other nation, including the laws and regulations of the People’s Republic of China.

(b) **REPORT AND RECOMMENDATIONS.**—Not later than 120 days after the date of the enactment of this Act, the Secretary, in consultation with the Secretary of Defense, shall report to the President and the Congress on the findings of the study described in subsection (a) and any recommendations the Secretaries consider appropriate.

(c) **REGULATORY EFFECT.**—Notwithstanding any other provision of law, any instrumentality of the United States vested with authority to review a transaction that includes an investment in

a United States domestic corporation may not conclude a national security review related to an investment in the energy assets of a United States domestic corporation by an entity owned or controlled by the government of the People's Republic of China for 21 days after the report to the President and the Congress, and until the President certifies that he has received the report described in subsection (b).

## **APPENDIX D. Dual-Use and Export Controlled Technologies; Access to Rare Earth Elements.**

Paragraph (3) of Section 1837 of the Energy Policy Act of 2005 requests that the overall study include “an assessment of the effect of investment in energy assets by entities located in the People’s Republic of China on the control by the United States of dual-use and export-controlled technologies, including the effect on current and future access to foreign and domestic sources of rare earth elements used to produce such technologies...”

This section refers to the bid by CNOOC Ltd. for Unocal Corp., which owns Molycorp Inc., the leading Western resource for Lanthanide (rare earth) products extracted from bastnasite deposits at their Mountain Pass, CA, facility. This facility is currently idle. Molycorp, Inc. also mines and mills molybdenum from a Questa, NM, facility.

The essence of the importance of rare earth materials to national security was succinctly summarized in a study done at the National Defense University in 2004:

Rare Earth Element (REE) metals and compounds are produced through the mining and beneficiation of mineral resources containing the 15 lanthanide elements as well as yttrium, scandium, and thorium. REE metals possess superior magnetic, thermal, and electrical properties and their use is widespread across critical military weapon system applications. Substitution of alternate materials for REEs will nearly always result in significant system redesign and degradation in system performance. REEs have emerged as key enablers driving next generation performance in the electronics, communications, optics, catalyst, and petroleum refining industries. China accounted for 94% of the total global mining production in 2003 and provides most of the U.S. requirements in REEs. Production mining at the Mountain Pass, California, site - the only economically viable domestic source - was suspended in 2003 after years of costly environmental compliance setbacks. Despite its total recent dependence on material imports originating from China, the U.S. maintains a technically advanced but economically modest raw material refinement industry. Global REE resources are sufficient to sustain and fuel expected industry growth well into the 21<sup>st</sup> century. However, the U.S. must be sensitive to the national security risks associated with dependence on a single global, potentially non-friendly, supplier. Even with the expected resumption of operations at Mountain Pass, the U.S. will remain substantially dependent on Chinese neodymium, samarium, and yttrium for certain critical military applications.<sup>86</sup>

Although the issue is moot, from the standpoint that Chevron prevailed in its bid for Unocal Corp., had the CNOOC Ltd. bid for Unocal succeeded, the U.S. government would have had to address the national security implications of CNOOC Ltd.’s acquisition of Unocal’s rare earth mining and production facilities.

Treasury Department regulations that implement section 721 (1988 “Exon-Florio” provision) of the Defense Production Act of 1950 address these concerns. Section 721 provides the President authority to suspend or prohibit any foreign acquisition, merger or takeover of a U.S. corporation which the President determines “threatens to impair the national security.” In 1988, the President, pursuant to E.O. 12661, delegated to the Committee on Foreign Investment in the United States (CFIUS--which had been established in 1975) certain responsibilities under Exon-Florio. The President alone retains power to take action under Exon-Florio to suspend or prohibit a transaction. CFIUS can only review, investigate, and recommend to the President.

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<sup>86</sup> D.V. Boslego et al. *Strategic Material 2004*, an industry studies report done at the Industrial College of the Armed Forces, National Defense University, Ft. McNair, Washington, DC, Spring 2004, pp. 6-7.

CNOOC Ltd. had stated publicly that it was willing to divest or take other actions with respect to any of Unocal's non-exploration and production assets in North America. In the past, CFIUS has required foreign purchasers to agree to exclude certain components of the target company from the acquisition as a condition of its not objecting to the transaction. Assuming no other objections to the transaction, CFIUS could have made such a partial divestiture a condition of its approval of CNOOC's acquisition of Unocal. (CFIUS would also of course had the option of deciding that such action was inadequate to address its concerns and could have recommended divestiture or some other course of action.).



## References

- Anderson, Jonathan. How to Think About China (Part 1). Asian Economic Perspectives. UBS Investment Research, 2005.
- "ANGOLA: Oil-backed loan will finance recovery projects." IRINnews.org. 12 Feb. 2005. The United Nations Office for Coordination of Humanitarian Affairs.  
[http://www.irinnews.org/report.asp?ReportID=45688&SelectRegion=Southern\\_Africa](http://www.irinnews.org/report.asp?ReportID=45688&SelectRegion=Southern_Africa).
- Arruda, Michael E., and Ka-Yin Li. "Legal reforms opening doors to foreign investment in China's oil, gas sectors." Oil and Gas Journal 102 (2004): 18. ProQuest.
- Blum, Justin. "National Oil Firms take Bigger Role." Washington Post 03 Aug. 2005.
- Boslego, D V. Strategic Material 2004. Industrial College of the Armed Forces. Washington, DC: National Defense University, 2004.
- "Chen Tonghai." China Vitae. 17 Oct. 2005 <<http://chinavitae.com>>.
- "China's CNOOC to buy stake in Australia LNG field-source." The China Daily 24 Oct. 2003, accessed on 19 October 2005 <<http://www.chinadaily.com>>.
- China's Energy Future to 2020: Initial Results. China Energy Group; Lawrence Berkeley National Laboratory. Washington, DC: Presentation made to Department of Energy on November 29, 2005.
- "China Country Analysis Brief." Energy Information Administration. U.S. Department of Energy. 5 Oct. 2004 <<http://www.eia.doe.gov/emeu/cabs/china.html>>.
- "China Creates Office to Safeguard Energy." China Daily 28 Apr. 2005, accessed on 19 October 2005 <<http://www.chinadaily.com>>.
- "CHINA ENERGY WATCH: Private Oil Groups Push for Change." Dow Jones News Wire 9 Aug. 2005. <<http://dowjones.com>>.
- "China, Indonesia forge strategic partnership." People Daily Online 26 Apr. 2005, accessed on 17 Oct. 2005 <<http://english.people.com>>.
- "China, Japan tug-of-war over Indochina." The Asia Times Online. 5 Oct. 2005. <<http://www.atimes.com/atimes/Japan/GJ05Dh03.html>>.
- "China looks at \$14 billion coal-to-oil plan as Beijing bets on oil price staying high." Financial Times 27 Sept. 2005. <<http://www.ft.com>>.
- China. National Development and Reform Commission. China Medium and Long Term Energy Conservation Plan. 2005.
- China. National Development and Reform Commission. Mid- and Long-term Development Plan of Renewable Energy. 2005.

- "China, Nigeria sign oil development agreement." The China Daily 19 Dec. 2004, accessed on 17 Oct. 2005 <<http://chinadaily.com>>.
- "China Set to Act on Fuel Economy." The New York Times 18 Nov. 2003, accessed on 5 Oct. 2005 <<http://www.nyt.com>>.
- "China." The World Factbook. 1 Nov. 2005. Central Intelligence Agency accessed on 11 Nov. 2005 <<http://www.cia.gov/cia/publications/factbook/geos/ch.html>>.
- "China to Speed up Nuclear Power Construction." People Daily Online 2 Nov. 2004 <[http://english.people.com.cn/200411/09/eng20041109\\_163186.html](http://english.people.com.cn/200411/09/eng20041109_163186.html)>.
- "China, Vietnam agree to promote South China Sea Joint Exploration." People Daily Online 7 May 2005, accessed on 26 Oct. 2005.
- "China, Vietnam to promote South China Sea joint exploration." People Daily Online 20 July 2005, accessed on 26 Oct. 2005 <<http://english.people.com.cn>>.
- "Country Analysis Brief: South China Sea Region." Energy Information Administration. U.S. Department of Energy. <<http://www.eia.doe.gov/emeu/cabs/schina.html>>.
- Crompton, Paul, and Yanrui Wu. "Energy Consumption in China: Past Trends and Future Directions." Energy Economics 27 (2005): 195-208.
- David, Zweig, and Bi Jianhai. "China's Global Hunt for Energy." Foreign Affairs 84 (2005): 25-38.
- Day, Mark. "Opening China's Oil Reserves to the World." International Financial Law Review 19 (2000): 35.
- Dorian, James P. Global Implications of Rising Chinese Energy Demand. China's Search for Energy Security and Implications for the U.S., 27 Sept. 2005, National Bureau of Asian Research.
- Energy Investment Outlook for the APEC Region. Asia Pacific Energy Research Centre. Tokyo, Japan, 2003.
- "Exploration and Production." Sinopec Corp. <<http://english.sinopec.com/index.jsp>>.
- "First Private Oil Company Sets Up Amid Disputes." The China Daily 29 June 2005. <[http://www.chinadaily.com.cn/english/doc/2005-06/29/content\\_455665.htm](http://www.chinadaily.com.cn/english/doc/2005-06/29/content_455665.htm)>.
- Forero, Juan. "China's Oil Diplomacy in Latin America." The New York Times 1 Mar. 2005, accessed on 8 Sept. 2005 <<http://nytimes.com>>.
- Gu, Mengdi. "China wants more pipelines for improved oil import security." Oil and Gas Journal 103 (2005): 59-61.

Herberg, Mikkal E. "Asia's Energy Insecurity, China and India." U.S. Senate Committee on Foreign Relations. Hearing. United States Senate on Foreign Relations, Washington, DC. 26 Jan. 2005.

"Indonesia, China sign 20 bln usd worth of trade, investment deals - report." Forbes.com. 31 Aug. 2005, accessed on 20 Oct. 2005 <<http://forbes.com>>.

"International Cooperation." CNPC.  
<<http://http://www.cnpc.com.cn/english/inter/OverseasOil.htm>>.

International Energy Annual 2003. Energy Information Administration. Washington, DC, 2003.  
<<http://www.eia.doe.gov/>>.

International Energy Outlook 2005. Energy Information Administration. Washington, DC, 2005.  
<<http://www.eia.doe.gov/oiaf/ieo/index.html>>.

"China Oil Majors Eye Madagascar oil Assets." Dow Jones News Wire 16 Nov. 2005.

"Japan-China Oil Dispute Escalates." The Washington Post 22 Oct. 2005.

Kindopp, Jason. China's Energy Security Policy & NOCs. China Energy Security Conference, 27 Sept. 2005, National Bureau of Asian Research. Eurasia Group, 2005.

Kong, Bo. An Anatomy of China's Energy Insecurity and Its Strategies. Pacific Northwest National Laboratory. Richland, Washington, 2005.

Marquart, Erich. "Intelligence Brief: China's Energy Acquisitions." Asian Tribune 03 Sept. 2005, accessed on 12 Sept. 2005 <<http://www.asiantribune.com>>.

McGregor, Richard. "China looks at \$24 billion coal-to-oil plan as Beijing bets on oil price staying high." The Financial Times 27 Sept. 2005, London Edition 2 ed.: 13. LexisNexis, accessed on 20 Oct. 2005.

"Napoleon of China's Oil Patch." Business Week Online 20 June 2005, accessed on 20 Oct. 2005 <<http://www.businessweek.com>>.

"New rules in global rivalry for oil." The Christian Science Monitor 04 Aug. 2005, accessed on 9 Sept. 2005 <<http://www.csmonitor.com>>.

"Oil and Gas in Troubled Water." The Economist. 6 Oct. 2005  
<[http://www.economist.com/research/backgrounders/displaystory.cfm?story\\_id=4489650](http://www.economist.com/research/backgrounders/displaystory.cfm?story_id=4489650)>.

"Operations Overview." CNOOC Ltd.  
<<http://www.cnooltd.com/operations/channel/opertions1298.asp>>.

"Petrobras and CNPC pledge oil cooperation." Dow Jones News Wire 02 Feb. 2005.  
<<http://dowjones.com>>.

- Pettist, Michael. "Buy Abroad, Benefit at Home." Far Eastern Economic Review (2005).
- "Press Release: Canada and China sign bilateral agreements and announce science and technology joint declaration." Prime Minister of Canada. 9 Sept. 2005, accessed on 19 Oct. 2005 <<http://pm.gc.ca>>.
- "Press Release: Joint Venture Partners Hold Groundbreaking Ceremony for Fukian Integrated Refining and Ethylene Joint Venture Project." Sinopec Corporate website. 8 July 2005. <<http://english.sinopec.com/en-newsevent/en-news/2621.shtml>>.
- "Press Release: World Bank Helps China Scale up Renewable Resources." The World Bank: News and Broadcast. 17 June 2005, accessed on 10 Oct. 2005 <<http://web.worldbank.org>>.
- "Renewable Energy Law Creates New Opportunity." People Daily Online 1 Mar. 2005, accessed on 8 Oct. 2005 <[http://english.people.com.cn/200503/01/eng20050301\\_175162.html](http://english.people.com.cn/200503/01/eng20050301_175162.html)>.
- Roett, Riordan. "Relations between China and Latin America/the Western Hemisphere." The Subcommittee on the Western Hemisphere House International Relations Committee. Rayburn House Office Building, Room 2172, Washington, DC. 6 Apr. 2005.
- "Russia, China energy cos. set up consortium." Business Week Online 8 Sept. 2005, accessed on 12 Sept. 2005 <<http://www.businessweek.com>>.
- "Russian Taishet-Nakhodka pipeline to reach China first." People Daily Online 8 Sept. 2005. <[http://english.people.com.cn/200509/08/eng20050908\\_207413.htm](http://english.people.com.cn/200509/08/eng20050908_207413.htm)>.
- Shriver, Randall G. "Written Statement." Senate Foreign Relations Committee. Hearing: Energy Trends in China: Implications for the U.S. Senate Foreign Relations Committee, Washington, DC. 26 July 2005.
- "Sino-Iranian LNG deal in Pipeline." People Daily Online 12 Apr. 2004, accessed on 20 Oct. 2005 <<http://english.people.com.cn>>.
- Sinton, Jonathan, Rachel E. Stern, Nathaniel T. Aden, and Mark D. Levine. Evaluation of China's Energy Strategy Option. Lawrence Berkeley National Laboratory. Berkeley, CA: The China Sustainable Energy Program, 2005.
- Sloan, Allan. "Subsidies from Chinese government play an even bigger role in CNOOC's deal for Unocal than anyone had previously thought." Newsweek 24 July 2005, accessed on 2 Sept. 2005 <<http://msnbc.msn.com>>.
- "Spratly Islands." The World Factbook. The Central Intelligence Agency. <<http://www.cia.gov/cia/publications/factbook/geos/pg.html>>.
- Tang, Irene. "China Energy Watch: New 5-year Plan to Stress Energy Efficiency." Dow Jones News Wire 21 Sept. 2005.

- The World Energy Outlook 2004. The International Energy Agency. 2004.  
<<http://www.worldenergyoutlook.org/>>.
- Tian, Mai. "New Authority to oversee energy sector." The China Daily 29 Apr. 2005, accessed on 17 Oct. 2005 <<http://chinadaily.com>>.
- "Top World Oil Consumers." Energy Information Administration. U.S. Department of Energy. 8 Nov. 2005  
<[http://www.eia.doe.gov/emeu/cabs/topworldtables3\\_4.html](http://www.eia.doe.gov/emeu/cabs/topworldtables3_4.html)>.
- Tremblay, Jean-Francois, and Alex Tullo. "Projects Start in China, Abu Dhabi." Chemical & Engineering News 83 (2005): 8. 20 Oct. 2005 <<http://pubs.acs.org/cen>>.
- "United States and China Covet Oil Sands." Forbes.com 12 Sept. 2005, accessed on 12 Sept. 2005 <<http://www.forbes.com>>.
- United States. RAND Corp / Project Air Force. China's Quest for Energy Security. 2000.  
<<http://rand.org/publications/MR/MR1244>>.
- "Unocal's Assets Offer Chevron a Near-term Boost." Washington Post 22 July 2005.
- Wang, Lijuan, and Kang Wu. The Establishment of the National Energy Leading Group. China Energy Series: Oil Edition Issue #1 September 2005. Honolulu, Hawaii: FACTS Inc., 2005.
- "Wei Liucheng." China Vitae. 17 Oct. 2005 <<http://chinavitae.com>>.
- White, Ben. "Unocal reveals Portrait of Negotiations." Washington Post 26 July 2005.
- Wilson, Nigel. "Australia-China LNG deal sealed." Energy Bulletin. 14 Dec. 2004. The Australian / News Corp. 20 Oct. 2005 <<http://energybulletin.net>>.
- Wu, Kang, and Tom Corcoran. China's Global Petroleum Investment by State Oil Companies. Role of the Government & Implications. Honolulu, Hawaii: Prepared by FACTS, Inc for The U.S. Department of Energy, 2005.
- Wu, Kang. Telephone interview. 4 Jan. 2005.
- "Xinjiang Plans to be China's Top Oil Producer." People Daily Online 14 June 2005, accessed on 7 Oct. 2005 <[http://english.people.com.cn/200506/14/eng20050614\\_190148.html](http://english.people.com.cn/200506/14/eng20050614_190148.html)>.
- "Zhou Yongkang Bio." People's Daily Online. 17 Oct. 2005  
<<http://english.people.com.cn/data/people/zhoyoungkang.shtml>>.