

China and the Geopolitics of Oil in the Asian Pacific Region

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Summary

China's growing demand for oil is significantly changing the international geopolitics of energy, especially in the Asian Pacific region. The recent growth in oil consumption, combined with forecasts of increased oil imports (especially from the Middle East), have led to deep concern among Chinese leaders regarding their country's energy security. They are responding in a number of different ways. In particular, they are determined to increase the security and reliability of oil imports by searching for new sources of supply, and to control purchases and transport lanes, while boosting national production at any cost. This is already causing tension and could lead to further disputes with the US and other big oil consumers, such as Japan and India, as well as with other Asian Pacific countries. However, enhanced cooperation among the big East Asian economies (China, Japan and South Korea) is also a possibility.

This document first of all presents an overview of China's energy sector, emphasising the strong growth in its energy demand to date and its potential for future growth. Secondly, we look at the oil sector, highlighting China's growing dependence on imports. The third part deals with the Chinese perception of energy security in the oil sector. Finally, the fourth part focuses on the geopolitical implications for the Asia Pacific region of China's search for oil.

Introduction

‘China’s quest for energy security is more than simple economics. It is about China’s overall development strategy; the direction of China’s modernization program; what kind of China is emerging as a world power; and ultimately it is about whether China will be a responsible leader in protecting the global environment’ (Jiang, 2005, pp. 4-5).

China’s strong economic growth in recent years has led to a very significant increase in its oil consumption. For example, oil demand doubled between 1995 and 2005, reaching 6.8 million barrels per day (bbl/d). China has been consuming more oil than Japan since 2003, the year it became the world’s second biggest consumer. In 2004, China consumed 6.6 million bbl/d, still only a third of US consumption (20.5 million bbl/d), but nonetheless a 16% increase over the previous year (five times more than the corresponding figure for the world as a whole).

Since it became a net oil importer in 1993, China has greatly increased its foreign purchases. In 2004, gross oil imports (crude and oil products) rose to 3.4 million bbl/d, representing more than half the country’s consumption. In 2000, imports accounted for barely 1.9 million bbl/d, equivalent to 38% of consumption.

Forecasts for the coming decades all point to strong growth in demand and, above all, a great increase in oil imports. Consumption could reach 12 million bbl/d in 2020 and 16 million bbl/d in 2030, while imports could increase even more quickly, reaching 7 million bbl/d in 2020 and 11 million bbl/d in 2030. In short, according to the vast majority of forecasts, China could more than double its consumption of crude and treble its oil imports over the next quarter of a century. China could increase its oil consumption by an average of about 4.5% a year over the next two decades, more than doubling the same figure for the world as a whole and more than quadrupling the consumption increases forecast for developed western countries.

This rise in consumption and in oil imports will be the result of several factors, including rapid GDP growth of about 6%-7% a year over the next two or three decades, compared with a rate of 9.5% between 1980 and 2004. Other important factors are the energy-intensive industrial sector, a sharp increase in the number of vehicles on the country’s roads (rising from 20 million in 2004 to at least 130 million in 2020), and the need to reduce the relative weight in energy consumption of inefficient and extremely polluting coal.

If Chinese oil imports increase from 4 million bbl/d today to 7 million bbl/d in 2020, to 8 million bbl/d in 2025, and to 11 million bbl/d in 2030, the global effects of such a rise will significantly affect both the availability and the price of crude. China is already actively seeking oil (and natural gas) beyond its borders. This search will undoubtedly accelerate in the coming years, with the effect of altering the geopolitics of energy and oil in the Asian Pacific region and around the world.

These geopolitical effects will be particularly intense because of China’s growing concern regarding increasing US hegemony in the Middle East (the source of a projected 70% of China’s oil imports in 2025 –double the current proportion–) and the

vulnerability of transported oil, most of which reaches China by sea, through the straits of Hormuz and Malacca. In particular, China intends to diversify its supply sources, importing more oil from Russia, Central Asia, West Africa and Latin America, and doing everything possible to secure transport lanes for its crude imports.

In the words of a leading specialist in international energy affairs:

‘Rapid energy growth in China is leading to dramatic impacts throughout the world in terms of commodity markets and prices, and within China, growing thirst for energy is creating a new sense of urgency and energy insecurity. Indeed, the means by which Beijing chooses to deal with its energy security will not only affect the Chinese economy, but the global economy as well. China’s energy needs have global implications today, as was witnessed last year through competition with Japan for imported oil from Russia. Ultimately the US, China, and Japan will be vying for the same Middle Eastern crude oil. Over the next two decades, China will play a larger and larger role in the Middle East since the country is so dependent on foreign oil imports, as well as Central Asia, West Africa, and other parts of the world which could help meet China’s growing energy requirements’ (Dorian, 2005, p. 8).

China’s efforts to control and develop its oil supply will have a considerable impact on the geopolitics of energy in Asia and around the world. China will also become a key and very active player in the international geopolitics of energy. Its energy trade with producing countries will bring with it a greater economic, political and military influence in these countries, and its territorial claims in the East China and South China seas may lead to conflict with some of its neighbours. The expansion of the naval forces of the People’s Liberation Army (PLA) could be considered an expression of China’s desire to protect the sea lanes it needs for transporting crude from the Middle East and West Africa.

From the US perspective, China’s energy policy creates several economic, environmental and geostrategic challenges to Washington:

‘First, China’s long-term impact on global energy supplies needs to be carefully analyzed, along with whether China’s current approach to energy security is conducive to U. S. and other oil-importing countries’ long-term energy strategies. Second, China’s heavy reliance on coal as an energy source poses a tremendous challenge to both China and the world, as much of this consumption involves unwashed coal and has led to a surge in air pollution and emissions of greenhouse gases. Lastly, to enhance its energy security, China has entered into energy deals with a number of countries of concern, including Iran and Sudan. These arrangements are troubling, especially to the extent they might involve political accommodations and sales or other transfers of weapons and military technologies to these nations’ (USCC, 2004, p. 252).

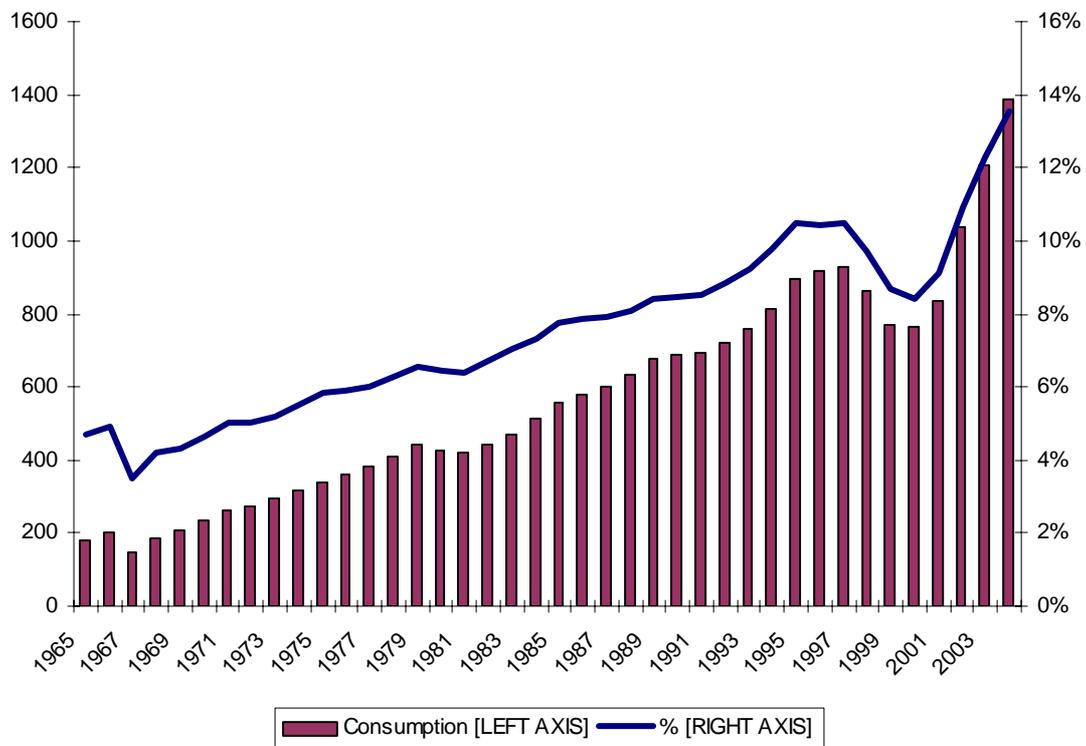
This document deals briefly with all these issues. First, it provides an overview of the energy sector in China. Secondly, it deals with the oil sector. The third part deals with the Chinese perception of energy security in the oil sector. Finally, the fourth part focuses on the geopolitical implications for Asia of China’s search for oil.

(1) Energy in China: a voracious appetite

China is the second largest energy consumer in the world, accounting for 13.6% of world consumption in 2004.

Its energy consumption has increased very sharply in recent years: between 2000 and 2004, consumption rose from 766 million tons of oil equivalent (Mtoe) to 1,386 Mtoe (rising from 8.4% to 13.6% of world consumption), as shown in Figure 1; annual growth in energy consumption averaged 16% from 2000 to 2004 –a period during which China was responsible for 54.2% of the increase in world energy consumption–.

Figure 1. Energy consumption in China, 1965-2004 (million tons of oil equivalent and percentage of world consumption)



Source: BP (2005).

The main reasons for the increase in energy demand have been the proliferation of factories, housing and office buildings (greatly increasing the demand for electricity, which has even been rationed in recent years), as well as the sharp increase in road transport.[1] The combination of an industrial structure that devours raw materials[2] and rapidly increasing sales of automobiles and household appliances have been responsible for a huge increase in energy consumption.

Besides, highly energy-intensive sectors, such as steel, cement, aluminium and chemical products, have grown dramatically in recent years. Growing urbanization and a higher standard of living have increased the use of heating, air conditioning and automobiles.[3] The growth in demand has been especially felt as a result of the three-year moratorium on new investment in the energy sector that the government imposed in 1999, in the wake of the Asian financial crisis (Constantin, 2005, p. 15).

For different reasons (low per capita consumption at present, predictions of strong GDP growth, a sharp increase in the number of registered vehicles, the creation of a strategic oil reserve, etc.), consumption is expected to continue increasing very fast: the IEA (2004) estimates that China will consume 2,100 Mtoe in 2020 (more than western Europe that year) and 2,500 Mtoe in 2030 (nearly as much as current consumption in the US and Canada combined).

Per capita energy consumption stood in 2004 at 1.1 tons of oil equivalent (toe) in China, 4.0 toe in Japan and Germany, 4.3 toe in France and 7.9 toe in the US. This means that China consumes, on a per capita basis, four times less than Japan, Germany or France, and seven times less than the US.

Chinese GDP growth forecasts generally range from six to seven percent a year over the next two decades:

- According to the International Energy Agency (IEA, 2004): 8.4% in 1971-2002, 6.4% in 2002-2010, 4.9% in 2010-2020 and 4.0% in 2020-30.
- According to the US Energy Information Administration (EIA, 2005): 6.2% in 2001-2025 in the basic scenario (with a possible high of 7.0% and a low of 5.3%).
- According to the Institute of Energy Economics of Japan (IEEJ, 2004): 7.2% in 2000-2020 (vs. 2.7% for the world as a whole).

Concerning automobiles (cars and trucks), there are some estimates that the 20 million vehicles registered in 2004 will rise to 60 million in 2010, 80-100 million in 2015, and 130-165 million in 2020. In 2004, transportation accounted for 33% of oil consumption and this could rise to 57% by 2020 (Dorian, 2005, pp. 7-8).

Finally, the government decided in 2004 to progressively build a strategic energy reserve, with the intention of stockpiling 35 days' imports or 100 million barrels by 2008, 50 days' imports or 300 million barrels by 2015, and 90 days' imports or 600 million barrels by 2020 (Logan, 2005, p. 3).

In the shorter term, Crompton and Wu (2005) predict that energy consumption will rise to 1,521.4 Mtoe in 2010, with an annual growth rate of 3.8% (a good deal lower than the 5.6% registered between 1980 and 1996, the year before the Asian crises).

According to estimates from Exxon Mobil (2004), between 2004 and 2030 energy demand will double in China, while it will grow by 50% in the world and 18% in Europe (Chart 1). Only India will see a greater increase in demand (164%), but it will reach a much lower level than China (29 million barrels a day of oil equivalent vs. 52 million).

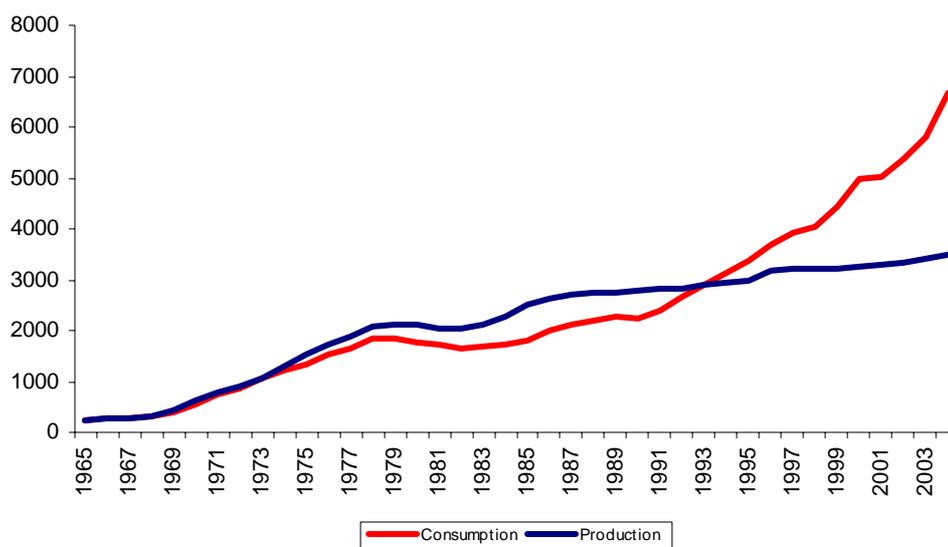
Chart 1. World energy demand, 2004 and 2030 (million barrels/day of oil equivalent and percentages)

	2004	%	2030	%	Increase
North America	55	25.0	69	20.6	25
Latin America	13	5.9	24	7.2	85
Europe	39	17.7	46	13.7	18
Russia and Caspian region	20	9.1	28	8.4	40
China	26	11.8	52	15.5	100
Japan	11	5.0	12	3.6	9
Africa	12	5.5	19	5.7	58
Middle East	11	5.0	18	5.4	64
India	11	5.0	29	8.7	164
Rest of Asia Pacific	22	10.0	38	11.3	73
Total	220	100.0	335	100.0	52

Source: Exxon Mobil (2004) and own calculations.

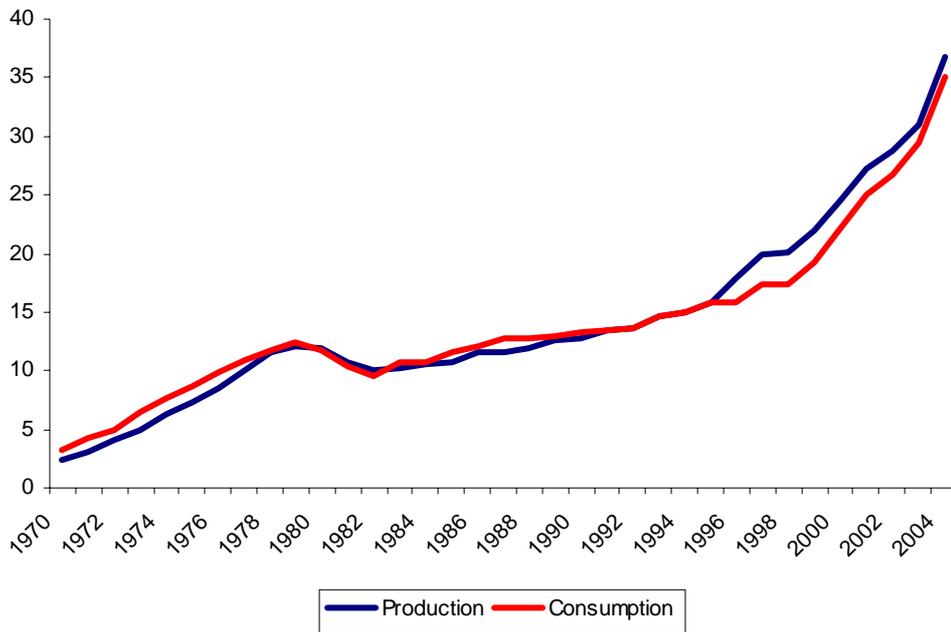
Increased energy production will not be sufficient, since although China is self-sufficient in coal and natural gas[4], it is not self-sufficient in oil (Figures 2, 3 and 4). Although coal supplies nearly 70% of primary energy consumption in China, the relative weight of oil has increased significantly in recent years, though remaining well below corresponding levels in other Asian countries (Chart 2)

Figure 2. Oil consumption and production in China, 1965-2004 (thousand bbl/d)



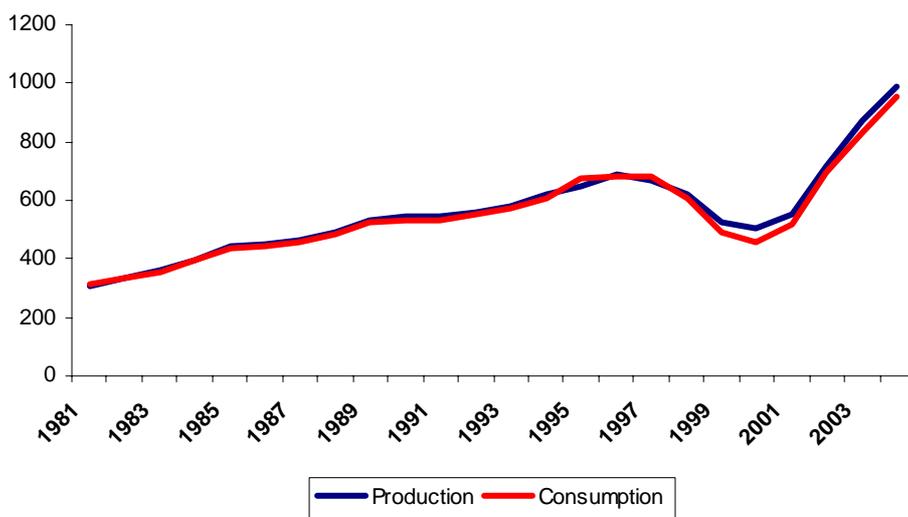
Source: BP (2005).

Figure 3. Natural gas consumption and production in China, 1970-2004 (Mtoe)



Source: BP (2005).

Figure 4. Coal consumption and production in China, 1981-2004 (Mtoe)



Source: BP (2005).

Chart 2. Distribution of primary energy consumption by source, 1991 and 2004 (in %)

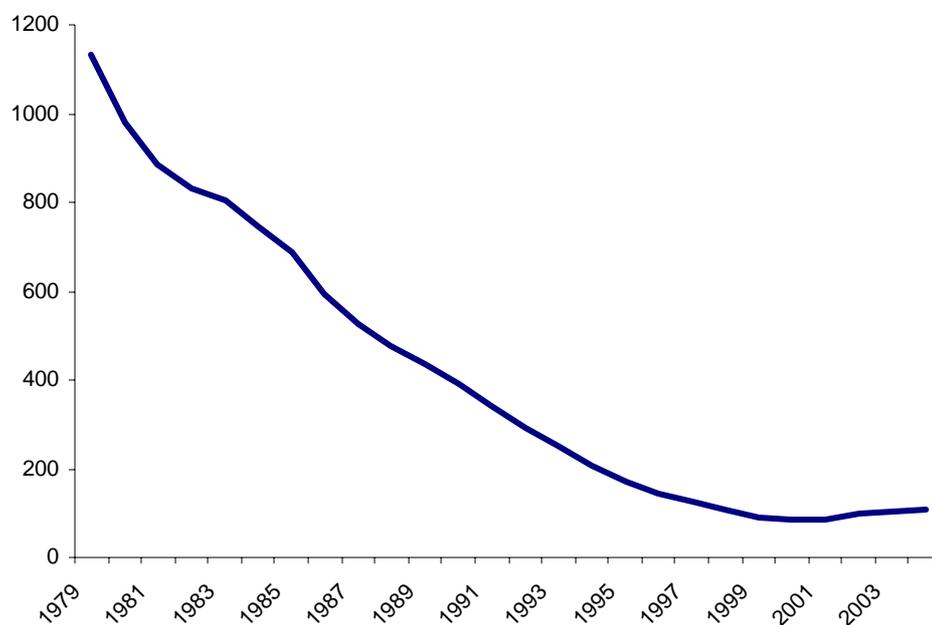
	China	China	Japan	Korea	US	World
	1991	2004	2004	2004	2004	2004
Oil	17.7	22.3	46.9	48.3	40.2	36.8
Natural gas	2.1	2.5	12.6	13.1	25.0	23.7
Coal	78.7	69.0	23.5	24.4	24.2	27.2
Nuclear	0.0	0.8	12.6	13.6	8.1	6.1
Hydroelectric and others	1.5	5.4	4.4	0.6	2.6	6.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

Sources: BP (2005) and APERC (2004), figure 6.

China's energy sector will have to face up to various challenges in the coming years (Andrews-Speed, 2005):

- In the short term, enhanced coordination and management of the energy supply is necessary. China has large oil and gas reserves, but these are mainly in the north-east of the country, far from the major consumption centers on the south and east coasts. Energy transportation infrastructures are inadequate and still not well enough developed.
- In the medium term, energy efficiency must be improved. Since energy consumption has grown more quickly than GDP in recent years, energy intensity, measured as the amount of energy per unit of GDP –which had fallen in the 1980s and most of the 1990s– has stabilized and even begun to climb slightly in the early years of this decade (Figure 5).^[5] Reducing dependence on coal is also necessary.
- In the long term, China must formulate a coherent energy policy that allows it to efficiently manage energy supply and demand, as well as the very significant environmental impact of energy production and consumption. Since coal will continue to be the major energy source and since coal consumption will increase substantially, CO₂ emissions will reach 8.13 billion tons in 2025 (21% of world emissions), compared to 3.32 billion tons registered in 2002 (14% of world emissions), according to EIA forecasts (2005). Of these 8.1 billion tons, 5.8 billion come from coal consumption.^[6]

Figure 5. Energy intensity in China (kg of oil equivalent per thousand yuan of GDP at 1995 prices), 1979-2004

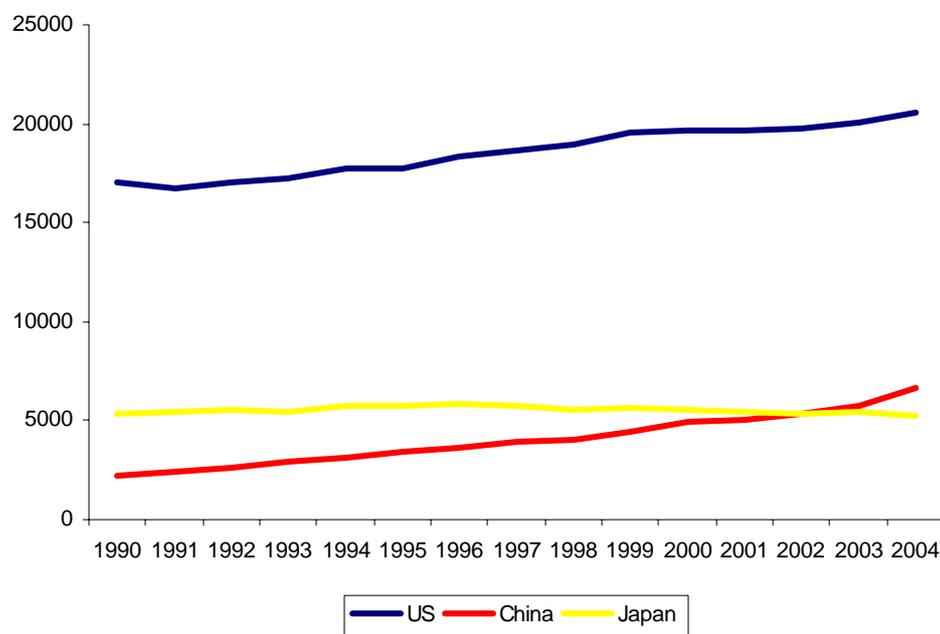


Sources: BP (2005), NBS (2005) and the author.

(2) Oil in China: a growing dependence on imports

China became the second biggest world consumer of oil in 2003, the year it overtook Japan (Figure 6). Only a third of its oil consumption is used for transportation, meaning that China has still not reached the world average (48%).

Figure 6. Oil consumption in China, Japan and the United States 1990-2004 (million bbl/d)



Source: BP (2005).

The country has seen a sharp rise in consumption, which doubled between 1984 (1.7 million bbl/d) and 1995 (3.4 million bbl/d), and again between 1995 and 2005 (6.8 million bbl/d); between 2000 and 2004 it rose from 4.9 to 6.6 million bbl/d, or from 6.6% to 8.3% of world consumption; between 1994 and 2004 average annual consumption grew by 7.8%. China was responsible for 34% of the increase in world oil consumption between 2000 and 2004 (and 63% in 2000 and 44% in 2002, as can be seen in Chart 3).

Increased Chinese demand has therefore been one of the factors in the sharp increases in oil prices, which, as is well known, doubled between mid-2003 and mid-2005 (Isbell, 2005).

Chart 3. Increase in world and Chinese oil demand, 1994-2004 (thousand barrels / day compared to the year before, and percentages)

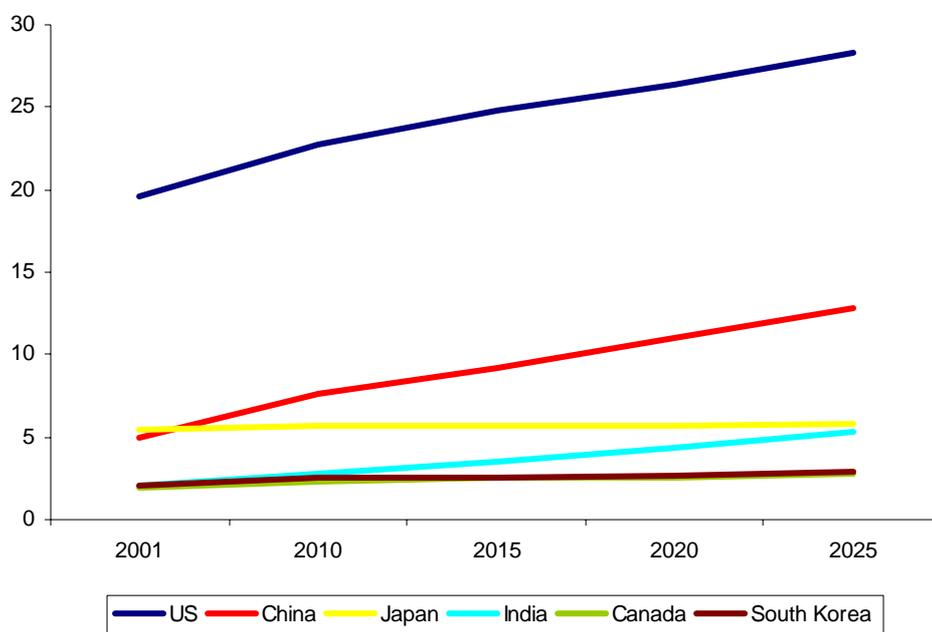
	World	China	%
1994	1,459	232	15.9
1995	1,127	245	21.7
1996	1,523	282	18.5
1997	1,917	263	13.7
1998	446	112	25.1
1999	1,616	370	22.9
2000	904	568	62.8
2001	501	46	9.1
2002	793	349	43.9
2003	1,248	412	33.0
2004	2,464	893	36.2

Source: BP (2005) and own calculations.

Among the causes of the recent rise in China's oil demand are strong GDP growth, the increasing number of registered vehicles, the use of fuel oil and diesel to generate electricity in order to overcome shortages,[7] and the trend towards replacing coal with oil and gas. Between 1994 and 2004, GDP grew at an annual average rate of 8.4%. Automobile sales in the domestic market, which stood at less than 250,000 units in 1999, reached more than two million units in 2003. Although installed electricity capacity had increased from 100 gigawatts in 1987 to 425 gigawatts in 2004, China had power shortages that year in 24 of its 31 provinces and autonomous regions, with frequent outages in some cities (KPMG, 2005, p. 4). The weight of oil in primary energy consumption rose from 19% in 1995 to 22% in 2004, while coal dropped from 77% to 69%.

Growth forecasts suggest that between 2002 and 2025 oil consumption will increase at an average annual rate of 4.5% in China (3.5% in India, 1.4% in the United States, 0% in Japan, 1.3% in South Korea and 1.9% in the world), according to the EIA (2005, p. 101). Figure 7 compares predicted consumption trends in several countries. China will increase its consumption greatly, among other reasons,[8] because it needs to reduce its dependence on coal, which has low energy efficiency and is extremely polluting, as we see in Chart 4. The proportion of oil as a primary energy source will rise from 22% in 2004 to 29% in 2020, while coal will drop from 69% to 56%, according to IEEJ forecasts (2004).[9] The number of vehicles in China will also increase greatly. Goldman Sachs (2004) estimates that it will rise from 19.2 million in 2005 to 42.5 million in 2010, to 131.6 million in 2020, and to 198.8 million in 2030, overtaking the number of automobiles in the United States between 2020 and 2025.[10] Another factor in the growing demand for oil will be the increase in the strategic reserve, which was initiated in 2005 in four locations in Zhejiang, Shandong and Liaoning provinces. Reserves will rise from 100 million barrels in 2008 to over 600 million barrels in 2020.

Figure 7. Projected trends in oil consumption in several countries, 2005-2025 (million bbl/d)



Source: IEA (2005) and EIA (2005).

Chart 4. Indicators of energy efficiency and carbon dioxide emissions, 2000

	GDP / energy	Energy per capita	CO₂ emissions / GDP	CO₂ emissions per capita	CO₂ emissions / energy
	(US\$ in PPP)	(kg of oe)	(kg per US\$)	(tons)	(tons per toe)
China	4.6	960	0.6	2.2	3.64
USA	4.4	7,943	0.6	19.8	2.42
India	5.0	513	0.4	1.1	3.34
Japan	6.4	4,058	0.4	9.3	2.30
Russia	1.9	4,288	1.4	9.9	2.26
Indonesia	4.1	737	0.4	0.5	2.83
Brazil	6.8	1,093	0.2	1.8	1.74
World	4.6	1,699	0.5	2.1	2.53

Sources: World Bank (2005), BP (2005) and own calculations.

As we can see in Chart 5, projected oil demand varies according to the main studies carried out (IEA, 2004, EIA, 2004 and 2005, and IEEJ, 2004, among others). In general,

estimates made in 2004 suggested that oil demand could reach 7.5 million bbl/d in 2010, 11 million bbl/d in 2020 and 13 million bbl/d in 2030. The EIA (2005) estimates 9 million bbl/d in 2010, 12 million bbl/d in 2020 and, applying a growth rate of 3.9% in 2025-30 (the same as in 2020-2025), 16.4 million bbl/d in 2030. The only clearly differing forecasts are by Goldman Sachs (2004), whose estimates are significantly higher than average, and the DRC (2003), which projects figures that are much lower than average. This is because Goldman Sachs expects GDP growth with a higher energy intensity than in other estimates. By contrast, the estimates made in 2003 by the Development Research Center (DRC) of the Chinese State Council have already been outstripped by actual events: consumption in 2004 (6.6 million bbl/d) was actually greater than that the forecast for 2010.

Chart 5. Oil consumption, 2004-2030 (million bbl/d)

	2004	2010	2015	2020	2025	2030
EIA, 2005	6.6	9.2	10.7	12.3	14.2	
IEA, 2004	6.6	7.5		10.1		12.8
EIA, 2004	6.6	7.6	9.2	11.0	12.8	
IEEJ, 2004	6.6	7.3		11.9		
GS, 2004	6.6	10.6	14.2	17.6	20.6	22.9
DRC, 2004	6.6	7.6		9.0-12.2		
DRC, 2003	6.6	6.4	7.2	8.8		
ERI-LBNL, 2003	6.6			10.4		
APERC, 2002	6.6			10.0		
Others (1)	6.6	7.1-9.6	8.3-11.4	8.4-9.5-12.8	10.6-15.2	

All cases refer to basic scenarios of average annual GDP growth):

IEA: 6.4% in 2002-2010; 4.9% in 2010-2020 and 4.0% in 2020-30;

EIA (2005): 6.2% in 2002-25; alternatives: 7.0%, and 5.3%;

EIA (2004): 6.1% in 2001-25; alternatives: 5.1%, and 7.1%;

IEEJ: 7.2% in 2000-2020; alternatives: 5.6% and 8.3%

(1) EIA and IEEJ alternative scenarios. Crompton and Wu (2005) predict 7.3 million bbl/d in 2010.

Sources: BP (2005), IEA (2005), APERC (2002), DRC (2003 and 2004), EIA (2004 and 2005), ERI-LNBL (2003), Goldman Sachs (2004) and IEEJ (2004).

The lowest estimates for 2010 (around 7.5 million bbl/d) seem too cautious in any case. In fact, consumption could well exceed 7.5 million bbl/d as early as 2007 (Crédit Agricole, 2005, p. 9). Supposing that oil consumption grows at an average annual rate of 4% in 2004-2010 (it was 7.6% in 2000-2004), the 2010 figure would be 8.4 million bbl/d. Even a rate of 3.5% would result in 8.1 million bbl/d.

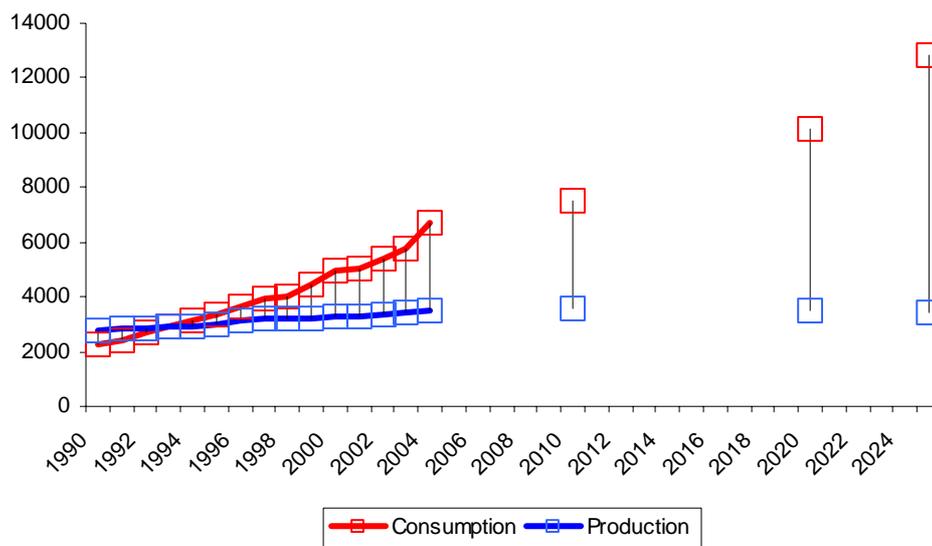
If IEA estimates (2004) for China's consumption in 2030 (12.8 million bbl/d) and world consumption in that year (121 million bbl/d) are accurate, China's share of world oil consumption will rise from 8% in 2004 to 11% in 2030. If EIA estimates (2005) for Chinese consumption in 2025 (14.2 million bbl/d) and world consumption (119.2 million bbl/d) are accurate, China's share will reach 12% in 2025.

On the supply side, China was the world's sixth largest producer in 2004, with 3.5 million bbl/d (behind Iran and Mexico, and ahead of Norway and Canada) and a long way behind the three main producers (Saudi Arabia, Russia, and the US). BP (2005) estimates China's reserves at 17.1 billion barrels (1.4% of world reserves). Thus, unlike other Asian countries (Japan, South Korea and even India), China has significant production and reserves.[11]

In recent years, production has grown slowly: between 2000 and 2004 production grew from 3.3 million bbl/d to 3.5 million bbl/d, an annual average growth rate of 1.8% (while consumption went up 7.6%); China was responsible for barely 4.5% of the growth in world production between 2000 and 2004.

Regarding the forecasts of production for the next decades, they suggest a maximum of 3.7 million bbl/d in 2010, followed by a gradual decline to 3.5 million bbl/d in 2025 (EIA, 2005), as we see in Figure 8. Although China is an important producer and will remain one, its main fields (Daqing, Shengli and Diaohe, in the north-east) are now old and beginning to run out, while its offshore projects (in the East China Sea, the Gulf of Bohai, the mouth of the Pearl river and the South China Sea) are small (Kenny, 2004, p. 38). Production gains seem most likely in the western province of Xinjiang, where authorities expect that 1 million bbl/d will be produced starting in 2008 (KPMG, 2005, p. 5).

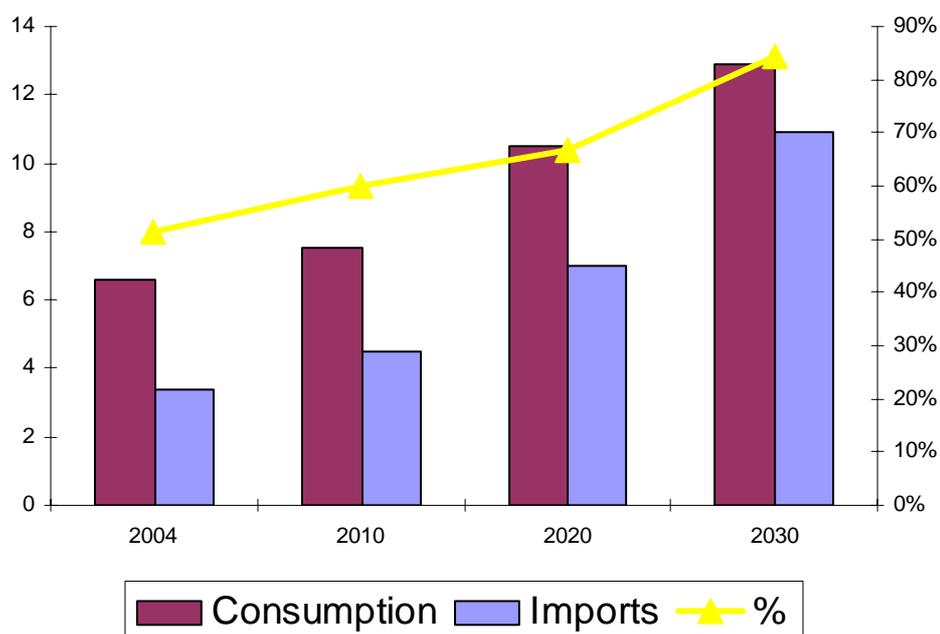
Figure 8. Oil consumption and production in China, 1990-2025 (thousand bd)



Sources: BP (2005) and EIA (2005).

Gross imports of oil (crude and products) rose to 3.4 million bbl/d in 2004 (China was the world's third biggest importer, after the US, with 12.9 million bbl/d, and Japan, with 5.2 million bbl/d) and could reach 5 million bbl/d in 2010, 7 million bbl/d in 2020 and 11 million bbl/d in 2030, according to the IEA (2004). The imported part of oil consumption will rise from 51% in 2004 to 60% in 2010, to 66% in 2020, and to 85% in 2030 (see Figure 9).

Figure 9. Chinese oil consumption and imports to China, 2004-2030 (million bbl/d and %)



Source: IEA (2004)

The IEEJ (2004) forecasts net imports of 3.5 million bbl/d (52% of consumption) in 2010 and 9.0 million bbl/d (75%) in 2020. The EIA (2004) forecasts gross imports of 8.6 million bbl/d in 2025 (with consumption of 12.8 million bbl/d, for a import share of 67%). The EIA (2005) forecasts imports of 10.7 million bbl/d in 2025 (75% of consumption).

(3) Chinese energy security in the oil sector: a serious concern

In the late nineties, an IEA (2000) study noted that the growing demand for oil and China's ever-increasing crude imports would have serious strategic implications, especially in terms of the country's relations with the Middle East, central Asia, Russia and the rest of East Asia.

Since then, the growing dependence on oil imports has created an increasing sense of "energy insecurity"[12] among Chinese leaders (Herberg, 2005, p. 6). There is even concern that eventual supply shortages or sharp increases in crude prices could endanger

economic expansion, job creation and social peace. Some Chinese analysts even refer to the possibility that the United States is practicing an “energy containment” policy toward China, or could implement one in the future. Chinese leaders tend to believe that dependence on imported oil leads to great “strategic vulnerability” (Kellner, 2005, pp. 74-75).

Moreover, the military intervention in Iraq by the US and its allies since 2003 has endangered Chinese investments made in the oil sector during the Saddam Hussein regime. The war in Iraq and growing US hegemony in the Middle East have made even more urgent for China to reduce its dependence on the Persian Gulf.

In late 2004, it became known that Russia had decided to give priority to the construction of the Tayshet-Skovorodino-Nakhodka oil pipeline (the route preferred by Japan, running from eastern Siberia to Perevoznaya Bay, in the Pacific) over the 2,300-kilometre Angarsk-Daqing route (preferred by China), running from the south of Lake Baikal to the main Chinese distribution center in the north-eastern province of Heilongjiang. In 2003, the Chinese company CNPC and the Russian company Yukos signed an agreement for the Angarsk-Daqing pipeline, but the difficulties that Yukos suffered in Russia afterwards, combined with a Japanese counter-offer, eventually led to the Russian company Transneft deciding to begin construction on the Tayshet-Nakhodka route (Kenny, 2004, p. 39). In the end, to compensate China, President Putin announced in July 2005 that Russia would give Beijing priority in railway transport of oil from Skovorodino[13] until the pipeline to the Pacific is finished around 2010, and the Skovorodino-Daqing branch is built by about 2020.

Furthermore, the US military presence in several central Asian countries since 2002 (with air bases in Kyrgyzstan and Uzbekistan) has been considered a risk to the future Atasu-Alanshankou pipeline between Kazakhstan and the Chinese region of Xinjiang. This pipeline would also connect China with the rest of the east coast of the Caspian Sea (with the already existing pipeline from Charjou, in Turkmenistan, to Atasu). This route could be as open to risk of US intervention (for example, a blockade in the case of armed conflict with Taiwan) as the sea lanes from the Persian Gulf (Constantin, 2005: 14). In any case, as of 2006, Russian and Kazakh pipelines together will carry only about 30 million tons a year –barely 15% of Chinese imports– and thus will not have a significant impact on the growing dependence on the Middle East (Kellner, 2005, pp. 78-80).

Chinese leaders tend to believe that competition for oil is a long-term zero sum game with the United States. They also believe that, if clear “containment” mechanisms were to be implemented, Washington would do everything in its hand to reduce China's access to imported oil.[14]

China's foreign and security policy has reflected these fears (Andrews-Speed *et al.*, 2002, Dannreuther, 2003, Downs, 2004, and Meidan, 2004): rapprochement with central Asian countries and Russia, a firmer stance on territorial claims in the South and East China seas, naval development, in part to protect maritime oil supply lanes,[15] etc.

Among the measures related strictly to energy issues and included in the 10th Five-Year Plan (2001-2005) and in the project of 11th Five-Year Plan (2006-2010), the government

has emphasized containing energy demand through saving and conservation energy, while at the same time increasing energy efficiency, developing new types of energy (nuclear, hydroelectric and others), increasing the security and reliability of imports, exploiting national resources more efficiently, creating a vast oil and gas transport system, and opening up the energy sector to private investment (Cole, 2003, pp. 52ss, APEC, 2005, pp. 193ss). These measures are clearly an essential part of Chinese energy security policy (Dannreuther, 2003, pp. 201ss).

Regarding the security and reliability of oil imports, China has been looking for new supply sources (in an attempt to diversify the risk inherent in over-dependence on the Middle East) and is trying to gain greater control over imports and transport routes.

To find these new supply sources, China has sought closer ties with countries that had little or no importance as suppliers in the 1990s (Russia, Kazakhstan, Canada, Australia, Sudan, Tunisia, Iran, Azerbaijan, Peru, Brazil, Argentina and Venezuela, among others), through trade agreements or by acquiring stakes in foreign companies.[16] This process got underway in the late nineties (IEA, 2000), with incipient relations with the Middle East in general, central Asia, Russia, Africa, Latin America, and North America. Three stages can be distinguished in the international acquisitions policy of the three main state-owned Chinese companies (*China National Petroleum Corporation*, CNPC; *China National Offshore Oil Corporation*, CNOOC; and *China Petroleum & Chemical Corporation*, Sinopec):

- The first stage (1992-1995) was exploratory and consisted of experimental acquisitions in Thailand, Canada, Indonesia, Peru and Sudan.
- The second stage (1997-2002) saw acquisitions in Sudan, Venezuela, Iraq and Kazakhstan, and to a lesser extent in Algeria, Azerbaijan, Chad, Ecuador, Indonesia (with the purchase of the subsidiary of Repsol YPF in 2002), Iran, Myanmar, Niger, Oman, Uzbekistan, Russia, Syria, Tunisia and Turkmenistan.
- The third stage, since the US military intervention in Iraq, has involved an accelerated acquisitions policy in: Algeria, Gabon, Egypt, Brazil, Argentina, Iran, Venezuela and Canada, among others.[17]

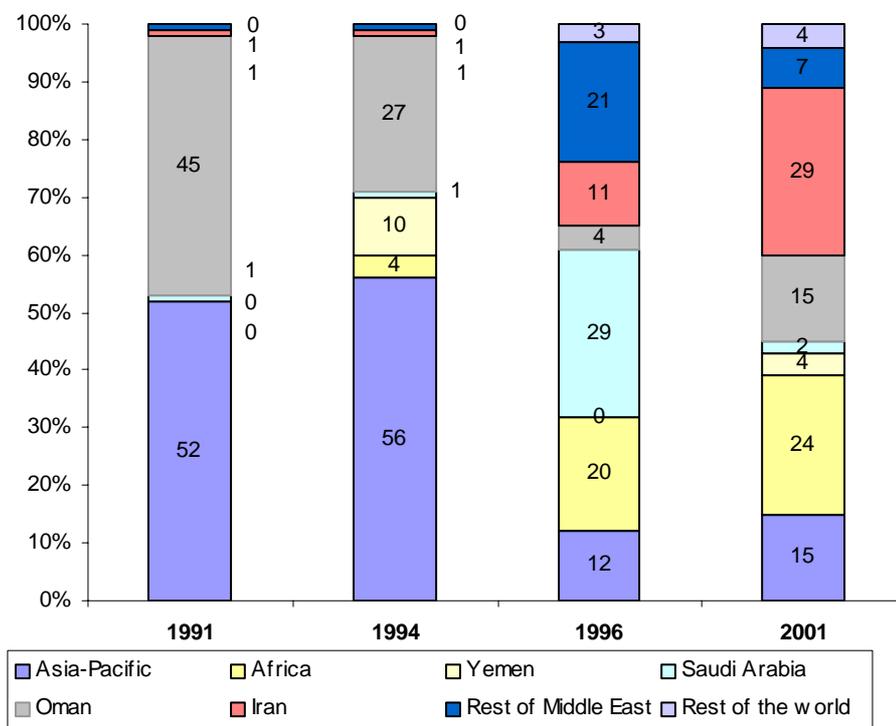
Among recent major agreements, the most noteworthy have been with Teheran (November 2004) for the exploration and development of the Yadavaran oil field in Iran by the Sinopec corporation, and with Caracas (December 2004) for the operation of fifteen fields in eastern Venezuela. The most important recent purchases include one in August 2005 by CNPC, which took over the Canadian oil company PetroKazakhstan, for 4.18 billion dollars, beating the offer made by the Indian ONGC-Mittal group.[18]

One of the results of this international expansion has been that, in the nineties and the early years of this decade, China has begun to diversify its supply sources geographically. As we can see in Figure 10, Chinese imports in the mid-nineties came mainly from the Asian Pacific region and Oman, while in 2001 the Asia Pacific share dropped in favor of Africa and other Middle Eastern countries. In 2003, the five main suppliers were Saudi Arabia, Iran, Angola, Oman and Yemen (Constantin, 2005, p. 28).

The flip side of this coin is that the United States has been suspicious of this policy of acquiring foreign interests.

China's closer ties (for energy-related reasons) to countries such as Iran, Sudan, Myanmar, Uzbekistan, Russia, Argentina, Canada and Venezuela is of great concern to the Americans, since it means a significant and potentially hostile political presence in conflictive regions and places where Washington has until now enjoyed exclusive influence.[19] China has also taken advantage of cooler relations between the US and Saudi Arabia to launch a diplomatic offensive aimed at developing closer ties with Riyadh (Izraelewicz, 2005, p. 169-70). In other words, China has successfully used the windows of opportunity that it has found open in recent years.

Figure 10. Geographic distribution of Chinese oil imports, 1991-2001



Source: APERC (2003), p. 38.

Some US analysts believe that China's agreements with Iran and Sudan include arms transfers or an implicit veto against possible sanctions by the United Nations Security Council (on the Iranian nuclear program or the Darfour massacres).[20]

Further recent evidence that energy-related competition between Beijing and Washington has become a sensitive issue was the attempt by CNOOC to buy the US oil corporation Unocal in 2005. This attempt ultimately failed when the Chinese company withdrew in the face of the “rarified political climate” in the US as a result of its offer. As is well-known, in early July, the US congress passed a resolution opposing the CNOOC offer for reasons of “national security”.

China's acquisitions policy has also been costly. Chinese companies have not hesitated to make significantly higher bids than their rivals. In general, concessions have been

gained at very high prices (Izraelewicz, 2005, p. 174). The three main Chinese oil companies have high acquisitions budgets due to the large profits obtained through high crude prices since they first went public in 2000 in New York and Hong Kong, and also due to government subsidies.

Finally, it is not clear that the international expansion policy contributes significantly to the country's energy security (Kellner, 2005, p. 78). Foreign oil production is not sufficient to satisfy rapidly growing demand[21], while it generates oil that is not necessarily cheaper than the one Beijing could find on the international market. In fact, China's foreign acquisitions may be primarily focused on another long-term goal: controlling oil at its source in order to influence prices not only as a strategic consumer, but also as a global producer (Meidan, 2004, p. 7).

At another level, China is attempting to gain greater control over oil imports and supply routes. For example, the Shanghai Cooperation Organization (SCO), made up of China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan, clearly has a component that involves energy, as well as security.[22] The Kazakhstan-China pipeline is scheduled to be completed in December 2005 and Beijing wants to complement it with a pipeline running in the same direction. At the SCO summit in Astana, the capital of Kazakhstan, in 2005, Iran, Pakistan and India participated as observers. There is a proposal on the table for a pipeline from Iran to India, passing through Pakistan, and China would like to see it extended to the Chinese border. In 2005, Beijing also signed a joint exploration agreement with Uzbekistan.

The free trade area to be formed by China and the ASEAN countries in 2010 also partly reflects Chinese interest in optimizing its access to Indonesian and Malaysian oil and gas, and to Singapore's refining capacity.[23]

While searching for new supply sources and more efficiently controlling imports, China is also doing its utmost to develop its domestic production. This involves, among other things,[24] extracting offshore resources in disputed border areas, including the Diaoyu/Senkaku islands (with Japan), the Nansha/Spratly Island (with several countries in the region) and the Xisha/Paracel islands (with Vietnam).

Regarding the energy transport network, a distinction must be made between measures aimed at facilitating imports and initiatives to distribute energy to consumer centers from import terminals or production centers (APEC, 2005, pp. 193ss, and KPMG, 2005, p. 9):

- Gas pipeline from Irkutsk to Korea and China (although Russia will not be exporting gas from Irkutsk until 2010).
- Gas pipeline from Sakhalin to the Chinese province of Shenyang.
- Liquefied natural gas (LNG) import terminals in the southern provinces of Guangdong and Fujian, to receive LNG imported from Australia and Indonesia starting in 2007.
- Oil pipeline from Kazakhstan to the Xinjiang region in China.
- Oil pipeline from Skovorodino to Daqing.
- West-east electric transmission network (generated by coal and hydroelectric power), with 100 GW projected in 2020.

- West-east gas pipeline (gas from Sichuan, Xinjiang and Shaanxi) to Beijing and east and north-east coast cities.
- West-east oil pipeline (Shanshan–Lanzhou–Gansu).

Among the consequences of these measures, two stand out (Dorian, 2005, and Feller, 2005):

First, China's efforts to control and develop its oil supply will have a considerable impact on the geopolitics of energy in Asia and around the world.

And second, China will become a key player in the geopolitics of international energy, since its energy trade with producing countries will bring with it greater economic, political and military influence in these countries. Until now, these countries have been very marginal in China's foreign policy, but they could become much more important, thus increasing the likelihood of economic and political rivalry with Japan, the United States and Russia in producing regions (Umbach, 2004 and CIEP, 2004).

(4) Oil geopolitics in the Asia Pacific region: the Chinese factor

Past and future increases in domestic demand for oil (and its impact on imports), growing US hegemony in the Middle East, and the vulnerability of sea routes for transporting crude from the Middle East, have changed Chinese perceptions of the international and Asian geopolitics of oil.

First of all, demand has increased very significantly and there is potential for great further increases. As was noted above, Chinese oil consumption between 1994 and 2004 rose from 3.1 to 6.6 million bbl/d, more than doubling, while world consumption increased by less than 20%. Also, according to EIA estimates (2005), in 2025 China will consume 14.2 million bbl/d (12% of world consumption) and will import 10.7 million bbl/d of this amount. The IEA estimates (2004) that oil imports could reach 11 million bbl/d in 2030, representing 85% of domestic consumption.

Second, growing US hegemony in the Middle East is a factor of concern to Chinese leaders. On one hand, the Middle East holds more than 60% of proven oil reserves (though it contributed less than a third of world production in 2004, as Chart 6 shows) and is the source of 37% of China's oil imports (Figure 11). Also, some estimates indicate that the Middle East's share of world production could rise to 46% in 2030 (APEC, 2005, p. 189). In part because of this, and also because it is difficult and costly to transport central Asian and Russian oil to China, the Middle East's share in Chinese imports could rise to 70-80% in 2015 (Wu, 2004, p. 2). For example, the EIA (2004) estimates that imports will rise to 8.6 million bbl/d in 2025, of which 5.7 million bbl/d (69%) will come from the Persian Gulf and only 1.7 million bbl/d (20%) will come from the former Soviet countries.

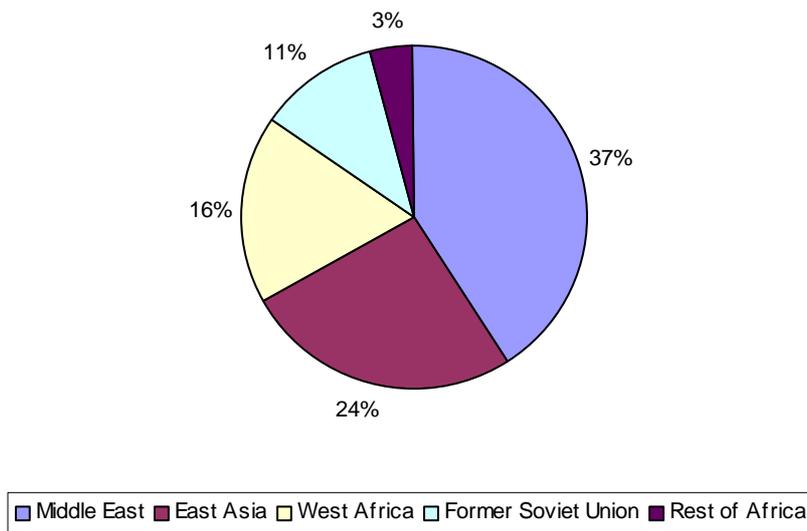
Figure 6. Proven oil reserves (million barrels, end of 2004) and oil production (million barrels a day, 2004)

Country	Reserves		Production	
	mb	%	thousand bd	%
Saudi Arabia	262,700	22.1	10,584	13.1
Iran	132,500	11.1	4,081	5.2
Iraq	115,000	9.7	2,027	2.6
Kuwait	99,000	8.3	2,424	3.1
UAE	97,800	8.2	2,667	3.3
Rest of Middle East	27,000	2.0	2,788	3.5
Entire Middle East	733,900	61.7	24,571	30.7
Russia	72,300	6.1	9,285	11.6
Kazakhstan	39,600	3.3	1,295	1.6
China	17,100	1.4	3,490	4.5
USA	29,400	2.5	7,241	8.5
World	1,188,600	100.0	80,260	100.0

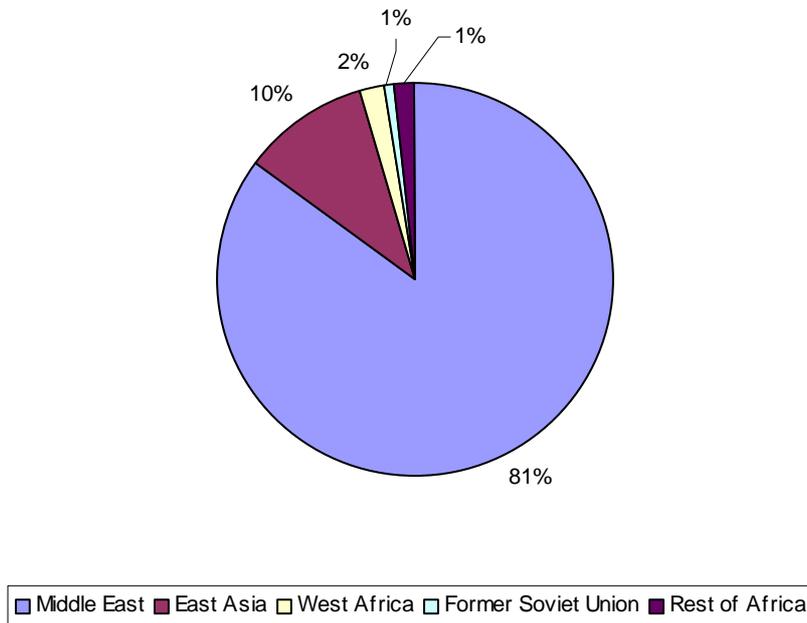
Source: BP (2005), p. 4.

Figure 11. Geographic distribution of Chinese and Japanese oil imports, 2004

CHINA: 3.4 million bbl/d



JAPAN: 5.2 million bbl/d



Source: BP (2005).

China and other big Asian Pacific importers, such as Japan and South Korea, will therefore be unable to avoid heavy dependence on the Middle East. Since this dependence is detrimental to energy security, they will have to do everything possible to mitigate it (APEREC, 2003, p. 53) by developing supply sources in Russia and central Asia, despite the logistic and financial difficulties involved in transporting oil from Siberia and the Caspian Sea to consumption centers in north-east Asia.

In any case, there is a “geopolitical imperative” for China to establish trade and political ties with the main producing countries in the Middle East (Saudi Arabia, Iran and Iraq). Doing so comes at a high cost for Beijing, since it will increase its economic dependence and its vulnerability to political turbulence in that part of the world (Samaleh, 2003, p. 1087). Dependence on the Middle East poses serious problems for China: (1) This is a region subject to close surveillance by the United States, whose influence has increased since the occupation of Iraq; 2) It is a politically unstable region; (3) Transport from the region via the straits of Hormuz and Malacca could be blocked by Washington if there were a serious bilateral dispute; 4) Competition for oil from the Middle East is very intense on the part of the US, Japan, India, the EU and others (Izraelewicz, 2005, p. 172).

Furthermore, the war in Iraq has been perceived as an attempt by the United States to permanently increase its influence in the Middle East. Whether or not Washington finally achieves this, it now has a foot planted in the country with the world’s third largest reserves.

Third, regarding the vulnerability of sea transport, it must be kept in mind that 75% of Chinese oil imports pass through the Strait of Malacca, which could be the object of terrorist attacks or even a blockade by the U.S. navy (for example, in the case of armed conflict with Taiwan).

These three concerns have led China to create a strategic oil reserve and, above all, to try to increase the diversification of its supply sources and transport routes (BTM, 2005, and Logan, 2005).[25]

The creation of a strategic oil reserve does not seem to worry the other main consumer countries, as long as it is done gradually, given the serious tension already existing in the world market. On the contrary, Japan and western countries consider this highly necessary as a way to reduce the risk of a Chinese energy crisis. Tokyo's position is that the Japanese experience after the oil shocks of the 1970s –when oil was stockpiled and measures were put in place to reduce consumption– could serve as inspiration for China.

By contrast, China's attempt to increase and diversify its oil supply and transport routes could lead to serious conflict with Japan and other Asian countries, and even with Europe and the United States.[26] The search for new sources of oil in the East China Sea and the South China Sea creates conflict with countries such as Japan or Vietnam (Daly, 2004). Investment in oil exploration and production abroad are fueling various rivalries, as are supply agreements with countries such as Iran, Russia, Kazakhstan and Sudan.

Meanwhile, China is helping build new pipelines to transport oil from Russia and Kazakhstan, and is looking into sea lanes that could be alternatives to the one through the Strait of Malacca (Kellner, 2005). The pipelines now under construction or scheduled to be built include the Russian pipeline from Taishet (eastern Siberia) to Skovorodino and Nakhodka, which could be extended from Skovorodino to Daqing, and the Kazakh/Chinese oil pipeline from Atasu (Kazakhstan) to Alashankou, Dushanzi and Lanzhou.

Regarding concerns about the chokepoint at the Strait of Malacca, there are four main (sea and land) alternatives: (1) building a 250-km oil pipeline or canal across the isthmus of Kra (Thailand) from the Andaman Sea to the Gulf of Siam; (2) using the Sunda Strait (between Sumatra and Java); the main problem, however, is that it is very shallow; (3) using the Lombok Strait (east of Java) through the Makassar Strait; however, this route is considerably longer and would raise the price per barrel by at least two dollars; or (4) lay down an oil pipeline from Myanmar to China (from the port of Sittwe in the Gulf of Bengal to Kunming in Yunnan province); this is already underway, but it will not solve the problem of transport from Yunnan to the provinces on the east and south coasts.

China's intention to increase and diversify its oil supply sources and transport routes is having geopolitical consequences in the Asian Pacific region (LRP, 2005, pp. 33-59).

There is a risk of conflict with its most important neighbors (Japan, South Korea and India), although there could also be cooperation on joint, coordinated access to

resources (Dannreuther, 2003), as the 2004 “Qingdao initiative”, for instance, made clear.[27]

Regarding the likelihood of conflict, a specialist at the National Bureau of Asian Research in Seattle wrote:

‘China’s increasingly mercantilist strategy to assert control of oil and natural gas supplies and transport routes risks fueling tensions and conflict in a region where the lack of regional institutions to manage conflict is already a major problem and a region which is facing a sensitive transition to accommodate China’s rising power over the next two decades. Energy competition is beginning to seriously aggravate existing and, in some cases, deepening rivalries between China and her neighbors’ (Herberg, 2005, p. 10)

There is a risk of conflict:

(1) with Japan over resources in Russia, the East China Sea and, to a lesser extent, in central Asia. [28] The Russian preference for the Taishet-Nakhodka oil pipeline has irritated China, which went so far as to temporarily suspend exports from Daqing to Japan. In the East China Sea, there are two main areas of dispute: the Chun Xiao, Dunquiao and Tianwaitan offshore gas fields, very close to the border between the two countries[29]; and the oil reserves near the Senkaku islands (which Chinese call Diaoyu), occupied by Japan and claimed by China, with a possible 95 billion barrels (Harrison, 2005).

(2) with Vietnam and other East Asian countries and territories over resources in the South China Sea and the Gulf of Tonkin. The Paracel islands are claimed by China, Vietnam and Taiwan, while the Spratly islands are claimed entirely by China, Vietnam and Taiwan, and partially by the Philippines, Brunei, Indonesia and Malaysia.

China and the Philippines came to an agreement in 2003 on joint exploration in the South China Sea, which irritated Vietnam. Petro China, a subsidiary of CNPC, obtained exploration permits from the Chinese government for several blocks of this sea, including some of the Spratly islands. For its part, Petro Vietnam began accepting prospecting offers in disputed waters, to Beijing’s chagrin. Hanoi asked China to stop its exploration in the Gulf of Tonkin and finally, in mid-2005, China, the Philippines and Vietnam agreed to carry out joint prospecting in the South China Sea.

Although territorial claims in the South China Sea are less likely to lead to disputes than in the past –especially since the signing of the Code of Conduct in 2002, the rapprochement between Beijing and Hanoi in recent years, and the tripartite accord of 2005– energy interests in the Spratly and Paracel islands could change the situation and eventually lead to conflict among the claimant countries.

(3) with India, since China wants a naval presence in the Indian Ocean and has sought closer ties with Myanmar to accomplish this. The expansion of the Chinese navy can be considered, at least in part, an expression of Beijing’s desire to protect maritime oil supply lanes and, eventually, natural gas routes. Also, India’s growing consumption is forcing Indian companies to compete with the Chinese for international agreements and investments in countries such as Angola, Russia and Kazakhstan.[30]

However, not all analysts consider conflict over energy resources to be inevitable and some believe that, in fact, we may see enhanced cooperation among east Asian countries (Dannreuther, 2003, CIEP, 2004, and NEAEF, 2005).

To begin with, the big countries in East and South Asia (China, India, Japan and South Korea) all share similar interests: reducing their dependence on oil imports from the Middle East by geographically diversifying their supply (to Russia or central Asia), while increasing the proportion of natural gas in their primary energy consumption.

Meanwhile, all of them have a common interest in the political and economic stability of the Middle East, which is –and will remain– an essential source of oil for China, Japan, South Korea, Taiwan and other east Asian economies.

The economies of Central Asia, Siberia, East Asia and the Russian Far East also complement each other in important ways: Central Asia and the center and east of the Russian Federation have abundant energy resources, Japan and South Korea can supply abundant financing,[31] and China can provide an abundant labor force and a huge, expanding market.

There are numerous problems with depending on Middle East oil: regional instability, long transport lanes vulnerable to piracy and terrorism, and the existence of chokepoints (such as the straits of Hormuz and Malacca), among others.

Switching over to natural gas (and renewable energies) makes sense from economic, geopolitical and environmental perspectives (NEAEF, 2005, pp. 3-4): gas is more efficient than other fossil fuels; the gas trade produces long-term agreements between buyers and sellers, which foments international stability; and gas is less polluting than other fossil fuels.[32]

There are also initiatives in which regional cooperation would make a great deal of sense: joint construction of shared energy transportation infrastructure (for example, oil pipelines from Siberia to the Pacific, gas pipelines from Siberia to the Pacific or from Sakhalin to Japan, China and the Korean peninsula, financing for an oil pipeline connecting the Middle East with central Asia, running south of the Caspian Sea); connecting Asian countries to the Russian electrical system; creating a strategic oil reserve for common use;[33] and joint operations in disputed areas of the East China Sea (Diaoyu islands) and the South China Sea (Spratly islands).

In short,

‘China’s needs for foreign energy supplies are more likely to foster interdependence and regional and international integration which should strengthen cooperation and responsible Chinese behavior’ (Dannreuther, 2003, p. 215).

Conclusions

China doubled its oil consumption between 1995 and 2005, while during the same period world demand grew by 20%. Since 2003, China has been consuming more oil than Japan and in 1993 it became a net importer. At present, its foreign purchases

account for more than half its consumption. Somewhat more than a third of these imports are from the Middle East.

China will undoubtedly more than double its oil consumption and triple its imports in the next twentyfive years. Growth factors include: China's still low per capita consumption, the strong projected increase in registered automobiles (the number of which could rise tenfold, to 200 million units in 2030), its growing strategic reserve (initiated in 2005) and the need to reduce the amount of (inefficient and very polluting) coal it uses as a proportion of its overall primary energy consumption. Imports will likely reach 60% of consumption in 2010 and 85% of demand in 2030. It is also predicted that the Middle East will be the source of more than 70% of crude imports – double the current proportion–.

The experience of recent years and the forecasts for the coming years have created a sense of strategic vulnerability among Chinese leaders. China's reaction over the past decade has consisted, first of all, in trying to increase the security and reliability of oil imports by searching for new supply sources, and to control imports and transport routes, while also boosting national oil production at any cost.

This double response has had –and will continue to have– significant geopolitical consequences, especially in the Asia Pacific region. To limit the problem of extreme (though inevitable to a large extent) dependence on the Middle East, while at the same time guaranteeing supplies from that region, China has used trade agreements and the acquisition of oil interests to establish closer ties with several producer countries and regions: Russia, Central Asia (especially Kazakhstan, but also Uzbekistan), Sudan, Iran, Venezuela and Myanmar, among others. This frenetic global search for oil, which will surely continue in the coming years, could create conflicts with other big importing countries (the United States, the European Union, Japan and India) and sometimes political tensions with the US (for example, over Sudan, Iran and Venezuela).

The construction of oil and gas pipelines from Russian and central Asia could also lead to conflict with Japan. The search for land and sea alternatives to the chokepoint formed by the Strait of Malacca (now the route for three quarters of China's oil imports) could lead to a strategic rapprochement with Thailand, Myanmar and Indonesia. Naval protection of lanes in the Indian Ocean and the South China Sea could cause tension with India, Vietnam and the US.

Moreover, the desire to increase national production at any cost has led –and will continue to lead– China to take a firmer stance on territorial issues, including its sovereignty in the East China Sea (especially the Diaoyu islands, known as the Senkaku islands to the Japanese) and in the South China Sea (especially the Spratly islands). A stronger stance on this issue could lead to major tension with Japan and other east Asian countries.

However, although it is true that there are several significant trends towards heightened geopolitical tension in the Asia Pacific region as a result of competition for oil, the possibility exists that the pragmatic countries of the region may reach enhanced cooperation agreements on energy issues. At the end of the day, China, Japan, South Korea and even India all share common interests, high among which is the desire to

reduce their dependence on the Middle East and to proportionally increase their consumption of natural gas.

It is still early to determine whether the Asia Pacific region is headed towards an era of increasing rivalries or, on the contrary, towards an era of greater cooperation on energy issues, particularly those involving the consumption and importation of oil. In any case, a move towards one scenario or the other will largely depend on China's strategic decisions in the coming years.

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[1]The number of automobiles (cars, trucks and motorcycles) rose from 6.3 million in 1990 to 12.9 million in 1995, 22.3 million in 2000 and 36 million in 2003, according to data from NBS (2005), charts 16-28 and 16-29. This huge increase in the number of registered vehicles (a six fold increase in 13 years) has been due mainly to rapid growth in per capita income, available highways and the national automotive industry. These factors are analysed in APERC (2004), pp. 25-27.

[2] In 2003, China, with a GDP equivalent to 4% of gross world product, was responsible for 40% of world consumption of cement, 31% of coal, 27% of steel, 20% of copper, 19% of aluminum, 8% of oil, etc.

[3]See "Asia's Great Oil Hunt", *International Business Week*, 15/XI/2004.

[4]However, China will no longer be self-sufficient in natural gas in the coming years, since consumption will rise to 2.6 trillion cubic feet (tcf) in 2010, 3.4 tcf in 2015, 4.2 tcf in 2020 and 6.5 tcf in 2025, while production will grow much less: 1.6 tcf in 2010, 1.9 tcf in 2015, 2.3 tcf in 2020 and 3.1 tcf in 2025, according to the EIA (2004 and 2005). In 2025, China will have to import more than half its natural gas. China is expected to become a net importer of natural gas by the end of this decade.

[5]Energy intensity, which was reaching the level of the developed countries, is now converging much more slowly and has stabilized at a considerable distance to the level prevailing in these countries. In 2003, China needed 832 toe to produce one million dollars of GDP at current exchange rates. This is four times more than the US (209 toe), six times more than Germany (138 toe) and seven times more than Japan (118 toe), according to BTM (2005).

[6]In 2025, per capita CO₂ emissions will still be considerably lower than US emissions: 5.6 and 22.7 tons, respectively. Total US emissions will then be around 7.98 billion tons, according to the EIA (2005). China will thus be producing the world's largest CO₂ emissions between 2020 and 2025.

[7]This explains why China has recently become the world's biggest consumer of industrial generators, ahead of the US.

[8]For example, one of the reasons is that per capita oil consumption is far below that of the most developed countries. In 2004, oil consumption stood at 236 kg in China, 452 kg in Brazil, 473 kg in Argentina, 1,500 kg in Germany, 1,551 kg in France, 1,876 kg in Japan and 3,171 kg in the US.

[9]Despite the enormous Three Gorges Dam project, the relative weight of hydroelectric energy in primary energy consumption will actually drop from 5.4% in 2004 to 2.7% in 2020.

[10]Although China will overtake the US in absolute number of automobiles, the number per thousand inhabitants will continue far below the US level (188 vs. 538 in 2030, respectively, compared to 32 vs. 513 in 2010, according to Goldman Sachs, 2004).

[11]India, for example, produced barely 0.8 million bbl/d in 2004, making it necessary to import 70% of its needs (2.5 million bbl/d). It has estimated reserves of 5.6 billion barrels.

[12]"Energy security" can be broadly defined as "the security of having an adequate supply of energy, at reasonable and stable prices, aimed at sustaining economic performance and growth" (APEREC, 2003, p.4). Also see: CIEP (2004), chapters 1 and 2.

[13]With 385,000 bbl/d to China and 192,000 bbl/d to Japan starting in 2008. See "China to Get First Track at Russian Oil: Putin", *Asia Times*, 15/VII/2005.

[14]For some arguments against the US carrying out an eventual energy "containment" of China, see J.A. Bader and L.F. Leverett, "Oil, the Middle East and the Middle Kingdom", *Financial Times*, 16/VIII/2005.

[15]China is developing deep water ports in Myanmar in order to access the Andaman Sea, and on the south-west coast of Pakistan (in Gwadar, on the Sea of Oman, near the Strait of Hormuz), undoubtedly for better control of its crude imports from the Middle East and Africa. See "The Energy Ties That Bind China, India", *Asia Times*, 12/IV/2005.

[16]"Big Shift in China's Oil Policy", *The Washington Post*, 13/VII/2005.

[17]For more details on Chinese acquisitions of foreign oil interests, see, among others, IEA (2000), pp.62ss and 72ss, Chang (2001), pp.23ss, BTM (2005), pp.3-4, Jiang (2005), appendix A, Kellner (2005), pp.76-78, KPMG (2005), pp.15-17, and Logan (2005), p. 4.

[18] "Chinese Beat India for Kazakh Oil Fields", *International Herald Tribune*, 23/VIII/2005.

[19]I.Bremmer, “Are the US and China on a Collision Course?”, *Fortune*, 24/I/ 2005; “China Stakes Claim for Global Oil Access”, *Los Angeles Times*, 17/VII/2005.

[20]The military or security trade offs believed to be linked to some energy agreements are a recurring argument among some US analysts. See, for example, the testimony of G.Luft, director of the Institute for the Analysis of Global Security, before the US-China Security and Economic Commission, 21 July 2005.

[21]Foreign investments now generate a flow of about 300,000 bd, which is less than 10% of imports, according to the EIA (*China Country Analysis Brief*, August 2005).

[22]“SCO.Suppression, China, Oil”, *The Economist*, 7/VII/2005.

[23]“Beijing’s Oil Diplomacy”, *Straits Times*, 1/VII/2005.

[24]Accelerating exploration and extraction of national petroleum resources means relying more on foreign companies, increasing the recovery rate for oil wells (from the current 34% to 50%) and manufacturing synthetic liquid fuels (SLF) from coal (Berger, 2004, p. 56)

[25]In addition, of course, to the decision to take steps to contain the growing demand for oil, as is explained in DRC (2004). A LBNL study (2005) insists on the priority importance of greater investment in energy efficiency, adjustments to relative prices (increasing the price of coal and oil, and reducing that of natural gas and renewable energies), and institutional changes (such as the creation of an Energy Ministry with sufficient administrative and financial resources).

[26]See, for example, the following very complete reports:R.Bajpae, “China Fuels Energy Cold War”, *Asia Times*, 2/III/2005, and “China Stakes Claim for Global Oil Access”, *Los Angeles Times*, 17/VII/2005.

[27]The Qingdao initiative on energy cooperation was approved in June 2004 by the foreign ministers of the 22 member countries of the “Asian Cooperation Dialogue” (ACD), including China, Japan, India and South Korea. It promotes greater cooperation on various issues, among them exploration and extraction, energy conservation, energy efficiency, renewable energies, the construction of oil and gas pipelines, the creation of strategic reserves, and transport security, as well as studying a possible regional electrical network and a regional energy transport network.

[28]See “China Gorging and Japan-China Resource and Energy Conflicts”, *Yomiuri Shimbun*, a 12-part series starting on 18/IV/2005, reproduced in part in *Japan Focus*, June 2005; on China and central Asia, “Caspian Oil Heading East”, *Asia Times*, 9/II/2005

[29]These three gas fields in the East China Sea are now being operated by China. Japan protested because it claims that its proximity to the border line (median line) could allow Chinese access to Japanese reserves. Japan considers the median line to be the border of its exclusive economic zone, while China claims the entire continental shelf for itself.

[30]“China and India:A Rage for Oil”, *International Business Week*, 25/VIII/2005.

[31]The IEA (2004) estimates that in 2001-2030 the energy sector will need 2.2 trillion dollars in China, one trillion dollars in Russia and another trillion dollars in Japan and South Korea together.

[32]Natural gas produces practically no sulfur emissions, less nitrogen oxide and particles, and emits 25%-33% less CO₂ than oil and 45%-50% less than coal, per unit of energy produced (NEAEF, 2005, p. 4).

[33] The ASEAN+3 group (the ten ASEAN countries plus China, South Korea and Japan) propose to foment cooperation to create national oil reserves and, later, make them available for joint use. See the *ASEAN Ministers of Energy Meetings + 3* (AMEM+3) and the *ASEAN+3 Oil Stockpiling Forum*.