Energy Security in Asia: China, India, Oil and Peace

Report to the Norwegian Ministry of Foreign Affairs

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April 2006

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ACRONYMS AND ABBREVIATIONS

ABARE	Australian Bureau of Agricultural and Resource Economics
BOFIT	Bank of Finland Institute for Economies in Transition
CNOOC	China National Offshore Oil Corporation
CNPC	China National Petroleum Corporation
CIL	Coal India Ltd.
DoE	Department of Energy (USA)
EIA	Energy Information Administration (USA)
GAIL	Gas Authority of India Ltd
GW	gigawatt
IAEA	International Atomic Energy Agency
IEA	International Energy Agency
IOC	Indian Oil Corporation
KOGAS	Korean Gas Corporation
LNG	liquefied natural gas
MOGE	Myanmar Oil and Gas Enterprise
NDRC	National Development and Reform Commission (China)
ONGC	Oil and Natural Gas Corporation
OVL	ONGC Videsh Ltd
Sinopec	China National Petrochemical Corporation
SLOC	sea lanes of communication
SPR	strategic petroleum reserves
TPES	total primary energy supply

EXECUTIVE SUMMARY

India and China are both characterized by a tremendous increase in energy consumption, of which an increasing share derives from imports. Very rapid economic growth always makes it difficult to arrive at a sound balance between demand and supply, and this tends to generate waste, bottlenecks and insecurity. Although both countries are trying hard to provide appropriate energy, increase their energy efficiency, and diversify their sources of supply, they are becoming increasingly dependent on imported oil, and the Persian Gulf is set to remain their predominant source of oil in the coming decades. Instability in the Middle East thus poses a serious challenge to the security of China and India, just as it does for Japan, the US and many European countries. The question of maintaining a stable supply of fossil fuels poses several security challenges. One is to boost one's own production, another to diversify one's sources of import, and a third to secure the transportation of oil and gas on vulnerable sea routes; or over land through pipelines that depend on long-term strategic relationships with the producing countries.

In China and India a heightened awareness of the geopolitical implications of energy supply and demand has given energy issues an increasing prominence both in their domestic and foreign policies. However, it is difficult to say if this leads to more tension in their foreign relations or if instead it pushes them towards increased international cooperation. Plans are certainly being made for future possible 'resource wars', but emphasis is presently being put on economic competition, and on seeking to maximise each country's position on the international energy market. Then again, such increasing resource competition may contribute to raising the stakes of conflict in areas where national jurisdiction has not been resolved (East China Sea, South China Sea), and also in some of the energy exporting countries. Burma is one such country, in which the energy security dynamics of India and China are played out, and this is detailed in an appendix to the report.

The report is based on available literature, online energy data, and communication with Indian and Chinese researchers. We have used country reports and statistics provided by the International Energy Agency (IEA), statistics, forecasts and analyses by the US Energy Information Administration (EIA), unpublished academic papers, books and articles by Indian and Chinese researchers, and reports by several European and American analysts.

Based on our assessments of the energy security strategies and interests of the major players in the region, the report outlines three scenarios for the future of international relations in Asia. The first, called 'Increased cooperation' is the most positive and also, in our judgment, the most likely. The second scenario, 'Conflict in East Asia', presents a possible embargo against China, and is perhaps the least likely, at least in the near future. The third scenario, 'The Middle East explodes' presents the nightmare scenario of a full scale 'resource war' with global impact and serious consequences for India and China. The situation in Iraq, and especially the ongoing developments

with relation to Iran's nuclear programme, force us to say that this scenario is not just a fantasy fiction, but a real possibility, even in the short term.

The final section of the report offers suggestions as to implications of the outlined scenarios for Norwegian foreign policy formulation. Four areas of cooperation that would improve energy security in China and India, as well as globally, are identified:

1) support for the promotion of energy efficiency,
2) assistance in the development of clean coal and gas technology for electricity production,
3) a campaign for engaging the world's great powers in a major research effort to develop transportation technologies that do not depend on oil,
4) assistance in the nomination and promotion of Indian and Chinese candidature for IEA membership.

Table of total primary energy supply, net oil imports and exports

	TPES (Mtoe)*	TPES per capita	oil & gas/TPES (%)	oil & gas consumption (Mtoe)	net oil imports (Mtoe)	net oil exports (Mtoe)
India	553	0,.52	26.2	145	84	
China	1409	1.09	22.2	313	105	
Taiwan	99	4.36	52.8	52	45	
Japan	517	4.05	62.2	322	254	
USA	2281	7.84	62.8	1432	571	
Norway	23	5.11	51.0	12		144
Russia	640	4.46	73.4	470		289
Saudi Arabia	131	5.81	100	131		392
Iran	136	2.06	98.0	134		129

Notes: * Total primary energy supply (TPES) is made up of indigenous production + imports - exports - international marine bunkers ± stock changes.

Sources: Key World Energy Statistics 2005. International Energy Agency (IEA) & IEA Energy statistics online (2003 figures).

1. Introduction

This project analyzes the strategic implications of India and China's growing consumption of energy, notably of imported oil, and the two countries' quest for energy security. India currently imports roughly 70% and China around 40% of its oil. As the energy needs of both countries continue to grow, their oil imports are set to increase substantially. Due to the size of their populations and their rapid economic growth, India and China face a formidable challenge in their pursuit of energy security. How the two governments seek to meet this challenge is vital to the future political stability of Asia as a whole.

Energy security is now high on the foreign policy agendas of both India and China. This report describes how the two governments have responded to their growing dependence on imported oil, how they cope with challenges to their energy security, and the strategic implications of these responses. Among the key issues are the ties between the two countries and their primary sources of imported oil, the Persian Gulf countries, their relations to the other major oil importing countries, such as Japan, the USA and the EU member states, as well as countries that provide alternative sources of oil and gas imports, including Russia, Kazakhstan, Sudan and Burma.

Energy security, which must not be confounded with self-sufficiency or energy independence, may be defined as 'a sound balance between energy supply and demand serving the purpose of facilitating sustainable economic and social development.' By 'balance' we do not just mean the relationship between the overall amount of supply and demand, but the fit between a variety of energy sources and a complex set of needs.[1]

When the G8 meet in St. Petersburg in July 2006, 'energy security' is on the agenda, but two of the world's main energy consumers, China and India, are not members. On 16 April 2006, the *India Daily* newspaper published an interview with Russia's Industry and Energy Minister Viktor Khristenko, who said: "One can say whatever one wants about Russia's role in the global energy world, but it is clear that this

cannot be discussed with Russia alone. It should be discussed with OPEC, with other major producers of energy resources as well as with major oil and gas consumers, like China and India because without them this discussion, let alone the development of any solutions, will not lead to anything good and there will be no global security."[2] As this statement suggests, energy security may be conceived of in national terms, but may also be seen as international. Daniel Yergin, the world's leading 'energy historian', argues that the concept of energy security needs to be expanded in two critical dimensions: 'the recognition of the globalization of the energy security system, which can be achieved especially by engaging China and India, and the acknowledgment of the fact that the entire energy supply chain needs to be protected." He also says that: 'For China and India, energy security now lies in their ability to rapidly adjust to their new dependence on global markets, which represents a major shift away from their former commitments to self-sufficiency.'[3]

Many authors have written recently about the end of the era of oil, or the 'twilight era of oil', which is often described as a period characterized by growing politicization of energy issues and increased consideration for how to use force to gain control over valuable supplies in a possible emergency.[4] As was made clear in the 'Carter doctrine' in 1980, because oil is so vital to the economic well-being both of individual nations and of the international economic system, it may be seen to justify the use of force in assuring its availability.[5] The preparedness to go to war over petroleum is certainly not a new phenomenon, but while most of the world has avoided such resource wars since the Second World War, it seems increasingly likely that the combination of high oil prices, a growth in the number of countries depending on imported oil, the increasing belief that the world's production of oil may peak already in the first half

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[1] Cf. Zha Daojiong 2005. "China's Energy Security and Its International Relations." (Beijing: unpublished paper), August: 1
[2] http://www.indiadaily.com/editorial/8040.asp (accessed 18 Apr 2006).
[3] Daniel Yergin 2006. 'Ensuring Energy Security.' *Foreign Affairs*, March/April: 69-82 (76-77, 71).
[4] A few examples are: Michael T. Klare 2001 *Resource Wars, The New Landscape of Global Conflict* New York: Henry Holt). Paul Roberts 2004. *The End of Oil: On the Edge of a Perilous New World* (Boston: Houghlon Mifflin); Michael T. Klare 2004. *Blood and Oil: The Dangers and Consequences of America's Growing Dependence on Imported Petroleum* (Metropolitan Books); Kenneth S. Deffeyes 2005. *Beyond Oil* (New York: Hill and Wang); These and other books have been met with other books and articles with less alarmist perspectives.
[5] Michael Mandelbaum 2005. *The Case for Goliath.* (New York: Public Affairs): 95.

of this century, and notably an unstable Persian Gulf region, will lead to the outbreak of new resource wars.[6]

In China and India, a rapid growth in oil imports and a heightened awareness of the geopolitical implications of energy supply and demand have been key factors in increasing the role energy issues play both in foreign policy and in national security planning. It is difficult to say if this will lead to increased international tension and conflict over resources, or instead to closer international cooperation. Resource competition may drive both cooperation and conflict. Increasing resource competition may raise the stakes of conflict in contested offshore areas such as the East and South China Seas, and also provoke internal conflict in oil exporting countries. Burma is one such country, in which the energy security dynamics of India and China are played out. As an appendix this report provides a case study of Burma, with a special focus on its role in energy security aspects of relations between India and China.

This report will:

- outline the composition of Indian and Chinese energy consumption and their relative dependence on imported energy (with a focus on oil and gas),
- describe the responses of India and China to their need for energy security,
- analyze the geopolitical implications of these responses with a special focus on Indian and Chinese agendas in the Middle East,
- outline three scenarios for international developments in Asia, related to India and China's energy security,
- present policy recommendations to the Norwegian government, and
- identify topics for further research.

The case study of Burma gives an overview of fossil fuel resources in the country and a short history of their exploitation, identifies the main actors and interests involved, nationally and internationally, and summarizes Indian and Chinese interests in relation to Burma as a supplier of natural gas. It further outlines future scenarios based

[6] See for instance Michael T. Klare, 'The Twilight Era of Petroleum', *TomDispatch.com* , August 5, 2005. For a more optimistic (and hopefully also more realistic) perspective, see Daniel Yergin 2006. 'Ensuring Energy Security.' *Foreign Affairs*, March/April: 69-82.

on the energy security strategies and interests of the major players in the region, and offers suggestions as to possible implications of these scenarios for Norwegian foreign policy formulation.

This study is based on available literature, online energy data, and communication with Indian and Chinese researchers. It builds on interviews conducted by Stein Tønnesson during a visit to Beijing, Shanghai and Xiamen in March 2005, and further research and interviews conducted during visits by Stein Tønnesson to Beijing 25. October - 1. November 2005, and by Åshild Kolås to New Delhi 14. December 2005 - 4. January 2006. Material used in this study include country reports and statistics provided by the International Energy Agency (IEA), statistics, forecasts and analyses by the US Energy Information Administration (EIA), unpublished academic papers, books and articles by Indian and Chinese researchers, as well as reports by several European and American analysts.

2. China's energy needs

2.1 China's energy mix

As of 2003, coal continued to dominate China's energy mix with 60.1% of total primary energy consumption, followed by oil (19.5%), combustible renewables and waste (15.4%), gas (2.5%), hydro (1.7%) and nuclear (0.8%).[7]

US DoE key energy statistics for China are as follows:[8]

Proven Oil Reserves (1/1/2005)	18.3 billion barrels
Oil Production (2004)	3.62 million barrels per day (bbl/d)
Oil Consumption (2004)	6.53 million bbl/d
Net Oil Imports (2004)	2.91 million bbl/d
Crude Oil Refining Capacity (1/1/2005)	4.65 million bbl/d
Natural Gas Reserves (1/1/2005)	53.3 trillion cubic feet
Natural Gas Production (2003)	1.21 trillion cubic feet
Natural Gas Consumption (2003)	1.21 trillion cubic feet
Recoverable Coal Reserves (2003)	126.2 billion short tons
Coal Production (2003)	1.63 billion short tons
Coal Consumption (2003)	1.53 billion short tons

IEA figures for electricity generation in 2003 are:[9]

Production from:	*Unit - GWh*
Coal	1542497
Oil	57596
Gas	13305
Biomass	2472
Nuclear	43342
Hydro	283681
Total production	1942893

[7] Online at http://www.iea.org/Textbase/stats.
[8] DoE, China Country Analysis Brief, August 2005.

This gives the following share by production source: coal (79.4%), hydro (14.6%), oil (3.0%), nuclear (2.2%), gas (0.7%) and biomass (0.1%). Oil dominates, of course, the rapidly growing transportation sector. In electricity generation however, coal and hydropower dominate, although electricity production also consumes a substantial amount of oil. The importance of natural gas and nuclear power are increasing, but from a very low level.

China has the world's second largest reserves of coal, and is both the largest consumer and producer of coal in the world. China's coal consumption in 2003 was 1.53 billion short tons, or 28% of the world total. Over the longer term, China's coal demand is projected to rise significantly. While coal's share of overall Chinese energy consumption is projected to fall, coal consumption will still be increasing in absolute terms. Several projects exist for the development of coal-fired power plants co-located with large mines, so called 'coal by wire' projects. China is becoming more open to foreign investment in the coal sector, particularly in modernization of existing large-scale mines and the development of new ones. Areas of interest in foreign investment concentrate on new technologies, especially technologies with environmental benefit, including coal liquefaction, coal bed methane production, and slurry pipeline transportation projects. Recent investors in this effort include BP, ChevronTexaco, and Virgin Oil. China plans to aggregate the large state coal mines into seven corporations, in a process similar to the creation of CNPC and Sinopec out of state assets. Such firms might then seek to pursue foreign capital through international stock offerings.[10] From an energy security perspective, a high dependence on coal may seem to enhance national security, since China has so much of it. But it does represent an enormous transportation challenge (and transportation consumes oil), and it does form a threat to the global climate through CO^2 emissions. Most of China's coal reserves are located in the northern and northeastern provinces of Shanxi, Shaanxi, Henan, Shandong, Heilongjiang and Inner Mongolia. China realized early that it is economically advantageous to export coal by sea to neighboring countries such as Japan, rather than transport it great distances internally by rail. In recent years China has also imported large quantities of coking coal by sea, from Australia.

[9] Ibid.

2.2 Oil

China's main oil field at Daqing in the northeast was developed in the 1950s, and allowed China to be both self-sufficient and export substantial amounts of oil from the 1960s through the 1980s. However, production at Daqing peaked in the 1990s, and no other similarly rich discoveries have been made. China's overall production has continued to grow slightly, but as an effect of a rapidly growing oil consumption, China shifted from a net oil exporter to a net oil importer in 1993. Since then China's production has almost stagnated, while its consumption has grown immensely. China is currently the world's second largest energy consumer and became the second largest oil consumer in 2003, after the United States. It is the largest oil importer outside the IEA, and relies on imports for 40% of total demand.[11] The Centre for Global Energy Studies expects China's oil consumption to grow by 5% or 330,000 barrels per day in 2006. In absolute terms this is higher than the expected 1.3% growth in US demand, which represents a 270,000 bpd expansion.[12]

In 2004 China's share of world oil consumption amounted to 8%.[13] China imported 40% of its oil that year, of which some 60% came from the Middle East.[14] Iran alone supplies about 14% of China's oil. IEA data show that Chinese oil demand grew by 11% in 2003 and 15% in 2004, in spite of a fast rising oil price. This made China the fastest growing oil consumer in the world. Although the growth was lower in 2005, primarily because of less use of oil in electricity generation, and although the Chinese government has set as one of its main aims to increase energy efficiency, everyone expects the Chinese oil demand – and imports – to continue to grow rapidly.[15] Since production is not expected to grow significantly, most of China's additional oil will have to be imported and net imports are likely to rise from 2.3 million b/d in 2004 to almost the double in 2010.

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[10] DoE China Country Analysis Brief, August 2005, online at http://www.eia.doe.gov/emeu/cabs/china.html
[11] Findings of recent IEA Work, available online at www.iea.org/textbase/nppdf/free/2005/findings.pdf
[12] 'China's Hu heads to US on energy efficiency wave.' *Boston Globe* 13 Apr 2006: www.boston.com/news/world/asia/articles (accessed 17 Apr 2006).
[13] BOFIT China Review Yearbook 2005, Bank of Finland Institute for Economies in Transition.
[14] Findings of recent IEA Work, available online at www.iea.org/textbase/nppdf/free/2005/findings.pdf
[15] According to IEA projections (which should be taken with a grain of salt), China's total oil demand will more than double from 6.4 million barrels per day (mb/d) in 2004 to over 13 mb/d in 2030.

China's demand for oil was exceptionally high in 2004, with a 15% increase in crude oil consumption. Factors in the increase included economic expansion, traffic growth and power outages, which increased private electricity generation and diesel demand. A higher oil price on the world market in the autumn did not at first decrease demand in China, partly because of an intricate internal pricing system that leads internal prices to be adjusted with some delay to the price on the international market in ways that may make it profitable for Chinese oil companies to import highly priced oil if they also possess domestically produced oil. Low retail prices, on the other hand, diminished the incentive for oil refiners to process expensive imported crude and hurt domestic supply of refined petroleum products. Chinese statistics are difficult to read, and often misunderstood.[16] According to one source, China imported 120 million tons of crude oil in 2004, which was 35% more than in 2003, and in the same year imports of refined petroleum products increased by 34%.[17] Such growth was unsustainable, and adjustments were made in 2005, leading to a lesser growth. These adjustments may have been related to the establishment of a high-level energy coordination panel, led by China's Prime Minister Wen Jiabao, who in 2006 led a campaign for increased energy efficiency.

For some years China enjoyed a refining capacity that exceeded its needs. This is no longer the case. Its capacity to refine crude oil was estimated to be about 6.2 million b/d in 2004. This roughly corresponds with the oil consumption, but the refineries were not used to their full capacity, so China actually refined only 5.46 million b/d in 2004, and this represented a major increase from the year before. Thus China also had to import, and continues to import, more refined petroleum products than its exports. There are plans to significantly expand China's refining capacity.

2.3 Transportation

China is now the world's third-largest vehicle market after the US and Japan, and since cars run almost exclusively on oil products, this has driven up China's oil consumption significantly. The transport sector in China increased its share of oil

[16] Robert E. Ebel 2005. *China's Energy Future.* (Washington DC: CSIS Press): 21-22.

consumption from 10% in 1978 to 25% in 2002. Cars now account for one-third of China's oil use. According to the State Council Development and Research Centre, Chinese automobiles are expected to consume 138 million tons of oil a year by 2010, by then accounting for 43% of China's total oil consumption. The research centre predicts that China's annual vehicle demand will reach 9.4 million units by 2010 and 18.9 million units by 2020, up from 5.7 million units in 2005.[18]

This growth not only pushes China's overall oil consumption upward, but also represents a huge pressure on China's refining capacity. As of 2002, China was an exporter of petrol with domestic petrol consumption reaching only 87% of refinery output. Petrol consumption in China in 2002 amounted to 876,000 barrels a day. In the same year China consumed 128,000 barrels per day of jet fuel, while its jet fuel refinery output totalled 120,000 barrels per day.[19] With the increase in vehicle sales, construction of new roads, and intensification of air traffic since 2002, it has been increasingly difficult for the Chinese refineries to keep pace, and China has been forced to import significant amounts of petrol.

2.4 Electricity generation

China had a total electricity generation capacity of 338 GW as of 2003, of which 253 GW were from thermal, 83 GW from hydro and 2 GW from nuclear power generation. Over 120 GW of generating capacity is currently under construction in China, as a result of new projects approved since 2002, but it is likely to take until 2007 in most areas for generating capacity to catch up with demand, with an expected 15% yearly increase in short-term demand. The largest project under construction is the Three Gorges Dam, which will be fully completed in 2009, and will supply a total of 18.2 GW. Another large hydropower project involves a series of dams on the upper portion of the Yellow River. Shaanxi, Qinghai, and Gansu provinces have joined to create the Yellow River Hydroelectric Development Corporation, with plans for the eventual

[17] The source is BOFIT China Review Yearbook 2005, Bank of Finland Institute for Economies in Transition.
[18] *People's Daily Online*, 'Buyers of big cars have to pay more tax', 23 March 2006, at http://english.people.com.cn/200603/23/eng20060323_252839.html
[19] Latest EIA Detailed Annual Data, at http://www.eia.doe.gov/emeu/world/country/cntry_CH.html

construction of 25 generating stations with a combined installed capacity of 15.8 GW.[20]

In 2005 China launched plans to increase its electricity production capacity by 20%, in response to power outages in many parts of the country in 2004, leading to much use of expensive oil-driven generators. China also wants to decrease the share of coal (around 80% in 2003) in electricity production. The intention is to increase the share of hydropower significantly from the current 14% and also boost the share of natural gas to 10% by 2020.[21] According to the US Department of Energy, natural gas will increase its share of electricity generation more than any other fuel, due largely to environmental concerns in China's rapidly industrializing coastal provinces, though the largest increase in absolute terms is still likely to be coal.[22]

According to projections from 2004 by ABARE, the share of nuclear power and gas in Chinese electricity generation is expected to increase significantly. Gas is projected to reach 5.4% of electricity generation by 2015, assuming that China begins importing liquefied natural gas (LNG) from both Australia and Indonesia in 2006 and 2007 respectively, and that three to four additional LNG projects are operational by 2015. Like everyone else, ABARE also expects coal to continue to dominate China's electricity fuel mix, still accounting for around three quarters of electricity output by 2015.[23]

The Chinese government plans to install 950 GW of electricity generation by 2020, but a recent survey by the consultancy firm Capgemini concludes that another 280 GW will be needed to support the targets of 6.5% GDP growth annually and a fourfold increase of per capita income. This will require a further investment of $180 billion, beyond the $410 billion currently planned. Chinese energy plans include a target of at least 240 GW of hydropower capacity by 2020, which means adding 7-9

[20] EIA China Country Analysis Brief, August 2005, online at http://www.eia.doe.gov/emeu/cabs/china.html
[21] BOFIT China Review Yearbook 2005, Bank of Finland Institute for Economies in Transition.
[22] EIA China Country Analysis Brief, August 2005, online at: http://www.eia.doe.gov/emeu/cabs/china.html
[23] Ball, Schneider, Fairhead, Short, 2004, 'The Asia Pacific Lng Market: Issues and Outlook', ABARE research report 04.1, online at: http://www.nautilus.org/aesnet/2005/MAY0405/APEC_LNG_MARKET.pdf

GW of new capacity annually. According to experts at the US DoE Lawrence Berkeley National Laboratory this means building the equivalent of the Three Gorges Dam every two years. China's total exploitable hydropower potential is estimated at 380 GW, but most sites are in remote areas of western China.[24]

Current plans also include raising the number of nuclear power plants from nine to 40 by 2020. China's total installed capacity for nuclear power generation increased from 2 GW at the beginning of 2002 to 15 GW as of mid-2005. Australia recently agreed to sell uranium to China for nuclear power generation. Two bilateral agreements were signed in April 2006, one on uranium transfer and one on nuclear cooperation. China plans a total of 27 GW of additional nuclear generating capacity to be completed by 2020, but even with this capacity expansion, nuclear plants will supply less than 5% of China's electricity needs because of the general increase in electricity consumption.

[24] China Energy Watch, 'Long-term Power Demand Underestimated', by Feiwen Rong, 8 March 2006.

3. China's energy strategy

The main concern in China's energy strategy is to increase its energy efficiency, which is very low by international standards: For every dollar of GDP produced in China, three times as much energy as the global average is being consumed.[25] From the point of view of energy efficiency, it is therefore extremely disadvantageous to invest in production in China. Increased energy efficiency is of course highly desirable both from a purely economic and a security perspective, and also for environmental reasons. A second concern is to secure access to energy for all parts of China at the lowest possible cost, either through domestic production or import. A third concern is, for reasons of security, to reduce dependence on imports, and also diversify and protect imports, so as to make China less vulnerable during a possible international crisis. China will continue to be self-sufficient in coal, but is likely to import three quarters of its crude oil by 2025, unless no major new discoveries are made on Chinese territory in the next few years. Although China has significant reserves of natural gas, difficulties of exploitation and transportation will probably also lead China to import a substantial part of its natural gas consumption, either as LNG or through pipelines from Siberia and Central Asia. In terms of threats to its energy security, Chinese policy makers have three major worries:[26]

- Sudden disruptions in provision of oil to the global market could trigger serious energy shortages and sharp price spikes that would have severe adverse effects on the Chinese economy.
- China might be affected by disruptions in tanker flows from unstable exporting regions such as the Persian Gulf, Central Asia and Africa.
- Japan and the USA might attempt to deny China vital oil supplies in the event of a confrontation, particularly over Taiwan, due to US strategic dominance in the Persian Gulf and other key oil exporting regions, US naval control of critical transportation routes, and its cooperation with the Japanese navy.

[25] Ebel 2005: 38.
[26] Mikkal E. Herberg 2005, "Asia's energy insecurity, China and India: Implications for the US", Testimony to the United states Senate Committee on Foreign Relations, July 26.

Chinese analysts recognize that China's growing dependence on imported Middle Eastern oil means that China has become increasingly vulnerable to disruptions of its oil supplies. The risk of transportation accidents, the safety of sea lanes of communication (SLOCs) through choke points such as the Hormuz and Malacca Straits, and also the risk of embargoes, are under serious consideration in contemporary China. The construction of overland oil pipelines is seen as desirable in order to mitigate China's vulnerability.[27] Although such pipelines may lead to dependence on the supplying country (Russia, Kazakhstan), many geopolitically oriented analysts see long-term contracts with these countries as preferable to dependence on sea-born oil. These arguments will be discussed in section two below. Another security strategy is to diversify fuel sources in order to reduce the need for oil. In electricity generation oil can be substituted by coal, natural gas, hydro and nuclear. Natural gas is more environment-friendly than coal, and gas may also be used as fuel for transportation in the future. Natural gas is thus increasingly viewed by Chinese experts as the fuel of choice.[28]

3.1 Energy efficiency and diversification

The key to enhancing sustainable economic growth, while also increasing energy security, is to increase China's energy efficiency. This is recognized by the Chinese government, who has set as a target to cut energy use per produced unit by 20% before 2010. In March 2006, Premier Wen Jiabao announced in a speech to the Chinese People's Congress that a cut of 4% would be made already in 2006.[29] China's poor energy efficiency comes out clearly if we compare it with Japan's. Japan's GDP of $4.7 trillion in 2005 was two and a half times higher than China's ($1.9 trillion). Yet China's energy consumption of 45.5 quadrillion Btu in 2003 was twice as high as Japan's (22.4 quadrillion Btu). Hence Japan gets five times more than China out of its energy. China, although relying on oil for only 25% of its energy consumption (as against 65% coal) now consumes more oil than Japan although Japan relies on oil for as much as 50% of its energy consumption (against 18% coal). In 2004, the Chinese oil consumption was 6.53 million bbl/d, while Japan's did not exceed 5.43 million

[27] Erica Strecker Downs 2000. *China's Quest for Energy Security* (Rand Corporation).
[28] Findings of recent IEA work, available online at www.iea.org/textbase/nppdf/free/2005/findings.pdf
[29] http://www.planetark.org/dailynewsstory.cfm/newsid/35467/newsDate/6-Mar-2006/story.htm (accessed 17 Apr 2006).

bbl/d in 2005. Since 2003, China has been the world's second largest oil consumer after the super consuming USA (20.8 million bbl/d in 2005).[30] There is thus enormous scope for improving China's energy efficiency. The pace of this increase in the next years will have a major impact not only on China's environment, economy and security, but on the whole world's.

A major cause for the growing oil consumption in China is the rapid growth in the country's number of cars, and in transportation more generally. However, there may still be hope that China can induce a more environment-friendly transportation culture than the one that prevails in the USA. New measures to encourage the sales of vehicles that use less gasoline have been introduced by China's Ministry of Finance. According to the new measures, higher consumption taxes will be imposed on passenger vehicles with an engine capacity larger than two litres. These taxes will be lifted to a maximum of 20%, rising from 8%. At the same time, levies on cars with an engine capacity between 1 and 1.5 litres will be cut to 3% from 5%.[31] This is just an example of the kind of measures China is undertaking – and should be encouraged to undertake.

Further efforts by the government to increase overall energy efficiency have included the reduction of coal and oil subsidies, and the promotion of a shift towards less energy intensive services and higher value-added products, as well as encouraging the import of energy intensive products.[32] China is currently also drafting a new law on improving energy efficiency, increasing energy reserves and limiting environmental damage from energy use. In its announcement of the new law, the National Development and Reform Commission (NDRC) stated that: 'With rapid economic growth, problems in the energy area are gradually showing up and the complicated international environment also poses a new challenge to the security of China's energy and economy'. A team of experts from 15 government departments were appointed to draft the law.[33]

[30] All figures here are from the EIA Country Analysis Briefs at www.eia.doe.gov
[31] People's Daily Online, 'Buyers of big cars have to pay more tax', 23 March 2006, at http://english.people.com.cn/200603/23/eng20060323_252839.html
[32] http://www.eia.doe.gov/emeu/cabs/chinaenv.html

The aggregate efficiency of Chinese energy consumption has improved in recent years, and China has an opportunity to relieve some pressure on the demand side by further increasing the efficiency with which its energy is used. Although the Chinese government has promoted energy conservation and accelerated the supply of energy through the use of market mechanisms, energy use is still inefficient due to inefficient usage of low-quality coal, outdated industrial equipment, and dysfunctional markets.[34] Everyone, both in China and the rest of the world, stands to benefit from increased Chinese energy efficiency.

Beijing's efforts to promote import diversification is somewhat more controversial. China's growing dependence on Middle Eastern oil is of course a challenge for China's energy planners, just as it is for Japan and the EU countries. Although Chinese projections of future oil imports are lower than those of the IEA, Chinese policy-makers and researchers recognise that the share of imported oil in China's energy consumption will rise irreversibly.[35] Proven domestic reserves are limited, so the growing demand for oil cannot be met by domestic production, although China, with the current oil price, will no doubt boost its exploration activities. China has responded to its growing oil imports with a range of measures aiming to reduce the country's vulnerability. These measures include investment in overseas oil exploration and plans for trans-national oil and gas pipelines. Such measures are also related to the construction of refineries, since refining technologies differ with the kind of crude oil provided by the world's various oil provinces.[36]

The Persian Gulf's share of China's oil imports has increased steadily in the last decade. It is today around 60%, but is estimated by IEA to rise to around 80% by 2010. Moreover, as of today as much as 80% of China's oil imports (just like Japan's

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[33] *Hong Kong Daily*, 25 January 2006.
[34] Los Alamos National Laboratory, 'Energy Consumption & Energy Demand', online at: http://www.lanl.gov/orgs/d/d4/energy/docs/china.consumption.pdf
[35] See for instance "Modelling China's Energy & Environment" (Jiang Kejun , Energy Research Institute), "China's Energy Demand Analysis and Carbon Emission Scenario" (Guo Yuan ,Energy Research Institute), "China's Coal Demand and Supply Outlook: An Integrated Analysis from Different Experts" (He Youguo ,China Technical Committee of Coal Industry, China Coal security Department) and "China's Electricity Power Investment Outlook and Challenges" (Ouyan Changyu ,State Grid Corporation of China), papers presented at China-IEA Seminar on Energy Modelling and Statistics, organized by IEA and the Energy Research Institute, China in Beijing, 20-21October 2003.

Taiwan's and South Korea's) are transported through the Malacca Strait, and despite all the effort that has gone into the expansion of the giant shipping group COSCO, 90% of the imported crude oil is transported on foreign-owned vessels. Since there is no way the Chinese navy can protect the long sea route from the Middle East through the Indian Ocean and the South China Sea, a primary objective of China's supply diversification strategy is to reduce dependence on oil from the Persian Gulf. Moreover, the current Chinese refineries are ill suited to refine the kind of crude provided from the Saudi oilfields, and much better suited for crude from some other countries, like Sudan. However, oil from Africa must also be transported through the Malacca (or Sunda or Lombok) Strait.

One tempting option for China's energy security planners is to give priority to developing technologies for more efficient use of coal, of which there are abundant resources in China itself. As we have seen, it also still covers 65% of the country's energy needs. But transportation of coal is expensive (and requires fuel), coal use is more labour intensive than oil, and its use has serious environmental drawbacks.

In response to both environmental concerns and concerns about China's growing import of oil, China has made plans to expand natural gas use and develop its natural gas industry. The target is to double the share of natural gas in China's total primary energy supply by 2010 from the current level of less than 2.5%, and to build a well-interconnected national gas supply network by 2020 from today's fragmented system.[37] The main elements of this development include the construction of infrastructure for importing natural gas (including pipelines and LNG facilities) as well as the expansion of China's domestic natural gas industry and supporting infrastructure. However, Chinas' own proven gas reserves are not abundant, and they are located far from demand centres, requiring the construction of long distance pipelines.

Construction of the 4000 km West-East pipeline (from Xinjiang Uighur Autonomous Region to Shanghai Municipality) began in 2002 and was, as of August 2004,

[36] Erica Strecker Downs 2000. *China's Quest for Energy Security*. (Rand Corporation).
[37] Erica Strecker Downs 2000, *China's Quest for Energy Security* (Rand Corporation): 72.

projected to begin delivering gas to Shanghai in January 2005, to supplement the gas already received by pipeline from Shaanxi province two years earlier.[38] The first LNG terminal project (located in Shenzhen, Guangdong Province) was approved in January 2000 at an estimated cost of $3.68 billion, with China National Offshore Oil Corporation (CNOOC) as the majority shareholder. The first phase of construction will provide LNG to Guangzhou, Shenzhen, Foshan, and Dongguan, while the second phase will expand coverage to five other cities by 2010.[39]

Chinese analysts realize that natural gas could also become a security hazard. Pipeline imports are no guarantee against supply disruptions, and LNG imports could be as vulnerable as oil imports to embargoes, blockades, and transportation accidents.[40] On the other hand a change in China's energy mix towards a greater reliance on natural gas imports as a substitute for imported oil enables China to diversify its energy supply sources, and diversification tends to be seen as a goal in itself. From a global perspective it is important that the world's gas reserves are far greater than the reserves of oil, and also less concentrated in the Middle East.[41] And from the Chinese perspective, it must be important that Indonesia, Malaysia and Australia all have substantial reserves of natural gas, which may be provided to China in the form of LNG.

3.2 Securing imports and developing strategic alliances

China's overseas oil projects are not just intended to enhance China's energy security by diversifying sources of oil supplies, but also by gaining control over upstream resources abroad. During the 1990s, China's oil companies, while going through a

[38] 'Shanghai gets gas from pipeline project.' *China Daily* October 8, 2003. 'East-West Pipeline Wrapped Up.' *China Daily* August 4, 2004.
[39] *Developing China's Natural Gas Market - The Energy Policy Challenges*, IEA/OECD, Paris 2002.
[40] Ji Guoxing, "Yatai nengyuan anquan hezuo: xingshi yu renwu" ("Energy Security Cooperation in the Asia-Pacific Region: Situation and Mission"), Guoji guancha (International Survey), No. 3, 1999, p. 10; Yan Xuetong, "Zhongguo fazhan miandui de guoji anquan huanjing" ("The International Security Environment Facing China's Development"), in Guoji xingshi fenxi baogao (Study Reports on the International Situation), Beijing: China Society for Strategy and Management Research, 1998, p. 8; and Yang Qing, p. 7.
[41] Yang Qing, "Yao cong zhanlue gaodu zhongshi LNG jinkou" ("Pay Attention to LNG Imports in High-Level Strategy"), Zhongguo nengyuan (Energy of China), No. 5, 1998, p. 5; "PRC Sees Natural Gas as Supplement to Petroleum," *Xinhua*, 16 October 1997, cited in Erica Strecker Downs 2000, *China's Quest for Energy Security* (Rand Corporation).

process of partial privatization,[42] entered a number of bilateral agreements on rights to oil and gas exploration blocks, extraction rights and stakes in oil and gas fields, many of which involved exclusive extraction and/or import rights to China, among other:

- with Angola on joint construction of a refinery and the purchase of crude oil,
- with Egyptian oil companies on forming a joint-investment company (with a Chinese majority share) to develop oil and natural gas,
- in cooperation with Italian AGIP to develop oil fields in Central Asia and Africa,
- with Kazakhstan to purchase 60% of Aktyubinskmunaigaz Production Association (controlling 3 oilfields with estimated recoverable reserves of 1 billion barrels),
- with Kazakhstan also to purchase 51% of the Uzen oil field (with estimated recoverable reserves of 1.5 billion barrels) and to conduct a feasibility study of an oil pipeline to China,
- with Indonesia to purchase interests in an oil field in the Malacca Straits (32.58% in 1993 and a further 6.93% in 1995),
- with Iraq in 1997, signing a 22-year production-sharing contract (50% Chinese) to develop al-Ahdab field (with recoverable reserves of 1.4 billion barrels),
- with Mongolia on oil extraction and the joint construction of a refinery in south-eastern Mongolia,
- with Papua New Guinea on rights to two exploration blocks offshore of Gulf Province (in a consortium with other foreign firms, including China International Trust and Investment Corporation, Marubeni, and America Garnet Resource),
- with Nigeria on oil exploration in the Chad Basin under an agreement with the Nigerian National Petroleum Company, and for the purchase of two blocks in the Niger River delta,
- with Peru for the purchase of the Talara Block,
- with Sudan on a 40% stake in the Greater Nile Petroleum Operating Company consortium to explore and develop the Heglig and Unity fields (with estimated reserves of 8.5 bb to 12.5 bb of oil), and on a pipeline from the fields to the Red Sea (completed in May 1999),
- with Taiwan's Chinese Petroleum Corp. to explore for oil in the South China Sea,
- with Thailand on a production-sharing contract to develop Sukhothai field,
- with Turkmenistan to invest in the restoration of oil wells, and
- with Venezuela to purchase stakes in several oil fields.[43]

[42] In 1998, the Chinese government reorganized CNPC and Sinopec to create two vertically integrated oil companies. CNPC transferred some of its oil fields to Sinopec, and Sinopec transferred some of its refineries to CNPC. For details, see Katherine Stephan, "Big Gusher," *China Trade Report*, Vol. 36, June 1998; and Fereidun Fesharaki and Kang Wu, "Revitalizing China's Petroleum Industry through Reorganization: Will it Work?" *Oil & Gas Journal*, 10 August 1998.

[43] Erica Strecker Downs 2000, *China's Quest for Energy Security* (Rand Corporation).

As of 2005 Chinese companies had further invested in Argentina, Bangladesh, Canada, Colombia, Ecuador, Malaysia, Mexico, Pakistan, Russia, Iran, and the Gulf of Mexico, as well as several countries in the Persian Gulf, and had made attempts to buy major shares in one Russian (Slavneft) and one American (Unocal) oil company.[44] Chinese oil companies CNPC, Sinopec and CNOOC and their subsidiaries are now broadening their equity stakes into North Africa, Southeast Asia (especially Indonesia), Latin America and North America (acquiring stakes in Canadian western oil sands developments). While China failed to overcome political opposition in the USA and Russia to Chinese ownership of one of their national oil companies, it had considerable success in acquiring oil concessions and contracts in countries that have a difficult relationship to the USA, and are subject to unilateral US sanctions (Sudan, Zimbabwe, Iraq (under Saddam Hussein), and Iran. This has led to worries in the USA that Chinese companies are undermining US sanctions policies.[45]

The great thrust in Chinese investment in overseas oil development in the 1990s should not be understood solely – perhaps not even mainly - as a response to Beijing's security concerns. Other important factors were the business interests of the Chinese oil companies, the structure and organization of the Chinese oil and gas sector, and the pricing policies that were in effect in the 1980s and 1990s. During the 1980s, the Chinese government created three large oil companies, each in charge of an industry sector. The China National Offshore Oil Corporation (CNOOC) controlled most of the offshore oil business. The China National Petrochemical Corporation (Sinopec) was responsible for refining and marketing. The China National Petroleum Corporation (CNPC), created from the Ministry of Petroleum Industry in 1988, was

[44] In 2003, Russia banned CNPC from bidding to purchase Russia's eight largest oil company, Slavneft. Amy Myers Jaffe and Ken neth B. Medlock III 2005. "China and Northeast Asia" in Jan H. Kalicki and David L. Goldwyn (eds). *Energy & Security* (Washington DC: Woodrow Wilson Center Press): 267-290 (280). In June 2005, CNOOC made a $18.5 billion offer to buy American oil company Unocal, topping an earlier bid by ChevronTexaco. Unocal's extensive oil interests in Central Asia were considered to be an excellent strategic fit for CNOOC. On August 2, however, CNOOC announced that it had withdrawn its bid for Unocal, citing political tension, which in the meantime had become all too evident, in the United States. A group in Congress (Democrats and Republicans alike) had used a variety of arguments to help ensure that the CNOOC bid failed. They argued that with $13 billion of CNOOC's bid for Unocal coming from the Chinese government, the offer did not represent a 'free market transaction'. Further, they argued that American corporations were prohibited from purchasing analogous assets in Communist China. For more details, see http://encyclopedia.thefreedictionary.com/CNOOC+Ltd.

[45] Mikkal E. Herberg 2005. "Asia's energy insecurity, China and India: Implications for the US", Testimony to the United States Senate Committee on Foreign Relations, July 26 2005.

responsible for exploration and production onshore and in the shallow offshore areas.[46]

The division of the oil industry along sectorial lines prompted internal competition between the companies for state funding and for increasing the prices of domestically produced crude oil, refined products, and petrochemicals. For a long time the Chinese government maintained a two-tiered pricing system that required CNPC to sell most of its oil to Sinopec and other industrial consumers at a state-controlled (first-tier) price that was a fraction of the open-market price. As a result CNPC was left with limited funds for investment in exploration activities, and this was one of the reasons why domestic production stagnated and imports soared.[47] In 1993, the Chinese government responded to this situation by gradually relaxing oil price controls to provide more money to CNPC for oil-field development. The first-tier price for crude increased in 1996 and 1997, resulting in enormous windfall profits for CNPC.[48] The value of CNPC's total output reportedly tripled from about $6 billion in 1993 to about $21 billion in 1997.[49] CNPC officials knew that if they did not invest this money quickly, it would be confiscated by the central government. The company was initially divided about whether to invest domestically or overseas. However, uncertainty about prospects for domestic development, and the ready availability of oil abroad prompted CNPC to invest overseas.[50] This strategy was of course supported by the relevant parts of the Chinese government, who entertained close relations with the CNPC.

China's largest oil company, CNPC, currently has 30 international exploration and production projects with operations in Azerbaijan, Canada, Indonesia, Myanmar, Oman, Peru, Sudan, Thailand, Turkmenistan, and Venezuela. The company holds

[46] Erica Strecker Downs 2000. *China's Quest for Energy Security*. (Rand Corporation).
[47] Erica Strecker Downs 2000. *China's Quest for Energy Security*. (Rand Corporation): 12 (citing Gaye Christoffersen 1998. "China's Intentions for Russian and Central Asian Oil and Gas," NBR Analysis, Vol. 9, No. 2, March
[48] Ibid.
[49] Trish Saywell and Ahmed Rashid 1998. "Innocent Abroad," *Far Eastern Economic Review*, 26 February: 50.
[50] Erica Strecker Downs 2000, *China's Quest for Energy Security* (Rand Corporation), citing Christoffersen 1998: 14.

proven reserves of 3.7 billion barrels of oil equivalent.[51] As of May 2005, CNOOC had signed 167 petroleum contracts and agreements with 72 foreign oil companies from 19 countries and regions. The total acreage of the 27 contracts and agreements under execution is about 120,000 sq. km. in 20 oil and gas fields.[52]

Although CNPC, Sinopec and CNOOC are still state-owned companies, they increasingly operate in the same way as private companies, setting up subsidiaries, organizing as shareholding companies and enlisting on stock exchanges. In 2000 CNPC diverted most of its high equity assets into a subsidiary, PetroChina, which was introduced on the Hong Kong and New York stock exchanges. BP initially purchased 20% of the shares on offer. Following this, both Sinopec and CNOOC made public offerings of minority shares. ExxonMobil, BP and Shell became the main investors in Sinopec, and Shell in CNOOC. CNPC further set up subsidiaries for drilling services and geological survey work, while CNOOC listed its oilfield services unit, China Oilfield Service Ltd. on the Hong Kong stock exchange in 2002.[53]

According to one Chinese analysis: 'Unless China invests the capital to control some oil resources, any even insignificant international economic, political, or military conflict could affect the supply and demand on the spot market, causing severe interference to our oil imports, to seriously undermine China's economic stability and sustained development'.[54] Overseas oil investments in which oil reserves are actually bought by Chinese companies are thus at least by some seen as an important part of the Chinese strategy to insulate the country against severe price spikes and stabilize the economy during an oil shock. Whether or not this is an effective strategy is disputed, since the Chinese companies tend to pay a very high price for such 'equity oil' and since the whole strategy builds on the assumption that the Chinese company will be able and willing to produce the oil, transport it to China, and supply it domestically for less than the international market price during a crisis.

[51] http://encyclopedia.thefreedictionary.com/CNPC
[52] http://www.cnooc.com.cn/defaulten.asp
[53] Kristina Sandklef 2004. *Energy in China: Coping with increasing demand* (Swedish Defense Research Agency).
[54] Lin Ye and Zhang Zhong, "Models of Development and Trends in Investment for Multinational Oil Companies," Guoji maoyi (*Intertrade*), 20 August 1997, pp. 29–31, in FBIS.

Another key element in China's attempt to secure its oil and gas imports is to make bilateral contracts with its neighbouring countries and import via pipelines. Pipelines can only be constructed where there are long-term agreements on supply, and if such agreements are realized, the assumption is that this will stabilize relations between supplier and receiver by raising the stakes of conflict. On the other hand, the realization of pipeline projects depends on confidence in the supplying as well as receiving country, and this often necessitates long-term strategic alliance building. The crisis between Russia and Ukraine in 2005 tended to reduce faith in the stability of pipeline agreements.

Several trans-national pipeline projects have been negotiated by China during the past decades. Among the most significant are the now operational oil pipeline to China from the Aktyubinsk and Uzen fields in Kazakhstan, and the proposed pipeline from Angarsk in Siberia. The Kazakhstan-China pipeline was temporarily shelved in the late 1990s, when the oil price was low, but in 2004 construction finally began on a 962 km pipeline from Atasu in North-western Kazakhstan to Alataw Pass (Alashankou) in Xinjiang. The pipeline, which is a joint 50:50 venture between a CNPC subsidiary and the Kazakh state-owned KazTransOil, became operational in December 2005, and has the capacity to carry 200,000 barrels a day (b/d). By 2011, after the construction of several more pumping stations, the pipeline's capacity is intended to double to 400,000 b/d.[55] China needs to make further investments, though, in order to transport this oil to its main markets.

The Russia-China oil pipeline has been another top priority project from the Chinese perspective. Two routes have been discussed: from Angarsk to the northern provinces of China via Mongolia, and to the north-eastern provinces of China, avoiding Mongolia. The favoured route was to Daqing, China's energy centre in the Northeast, and at one point China thought it had a done deal with the Russian oil company Yukos. However, Yukos became embroiled in an internal Russian power struggle, and as became clear in December 2005, Russia eventually preferred a third Japanese-proposed route on Russian territory along the Chinese border to the port of Nakhodka. This pipeline is meant to be built with Japanese funding, and will provide Russian oil

to a port city, with Japan, South Korea, China and other countries being free to buy the oil at market price. From President Putin's perspective, this seemed preferable to a bilateral arrangement with China. However, it remains possible to construct a side-line to Daqing, and the whole pipeline project, although highly prioritized by Moscow, may still run into difficulties. One problem is to obtain loans above the already substantial loan of $7 billion promised by Japan.

The construction of a gas pipeline from the Kovyktinskoye field near Irkutsk in eastern Siberia through Mongolia to north-eastern China is another long-term subject of negotiation between China and Russia.[56] The first official expression of the two countries' intent to develop this pipeline was a memorandum of understanding signed between CNPC and the Russian Ministry of Fuel and Energy in November 1994.[57] Both sides signed agreements on the construction of the pipeline during Russian Prime Minister Chernomyrdin's visit to Beijing in June 1997 and during a Sino-Soviet summit in November 1997. The June accord envisioned the export of approximately 2 billion cubic feet per day (bcf/d) for 30 years. The November accord indicated that of the approximately 2 bcf/d the pipeline is expected to carry, 1 bcf/d would go to China and the remainder would be available to South Korea and Japan. It also proposed that the pipeline be completed in 30 months at a cost of $12 billion. Neither accord specified how the pipeline would be financed.[58]

Since the late 1990s, South Korean KOGAS (Korean Gas Corporation) has lobbied to influence pipeline construction plans, to secure gas deliveries from Kovyktinskoye to its own buyers. However, in early 2004 Russia's gas pipeline monopoly Gazprom signalled that it wanted to send gas from Kovyktinskoye to Western Europe instead of Northeast Asia, and delay delivery to China until 2012. The reasoning was that the Asian demand for gas was too limited compared with the supply potential from

[55] For more details see http://www.cnpc.com.cn/english/xwygg/news/200512190001.htm
[56] This section is drawn from Erica Strecker Downs 2000, *China's Quest for Energy Security* (Rand Corporation). See also Gaye Christoffersen 1998, "China's Intentions for Russian and Central Asian Oil and Gas," NBR Analysis, Vol. 9, No. 2, March.
[57] Quan Lan and Keun-Wook Paik 1998, *China Natural Gas Report* (London: Royal Institute of International Affairs): 106.
[58] The high cost is probably the major factor, although Downs (2000) suggests that some senior leaders and commanders of the People's Liberation Army regard the construction of a natural gas pipeline

Kovyktinskoye. This decision seemed to be reversed when Gazprom and CNPC sealed an agreement on strategic cooperation in October 2004 in Beijing, during an official visit by Vladimir Putin to the PRC. To complicate the matter further, in 2005 Kovyktinskoye gas field operators TNK-BP, RUSIA Petroleum and East Siberian Gas Company, together with the Government of Buryatia, recommended to the Russian Ministry of Industry and Energy to consider a gas pipeline route to Buryatia, running along the southern coast of Lake Baikal (the environment of which is threatened by more than one pipeline project). This recommendation contradicts the program for creating a unified gas production, transportation and supply system in East Siberia and the Far East developed by the Russian Ministry of Industry and Energy and GazProm.[59] At present the main parties to the disagreement are the license holder RUSIA Petroleum, in which TNK-BP holds a majority interest, and Gazprom, which controls all pipelines exporting Russian natural gas outside the country. However, as of today Gazprom has no assets in East Siberia and the Far East. The latest news is that during the visit of President Putin to China on 21-22 March 2006, Gazprom and CNPC signed an agreement on gas supplies from Russia to China, under which the first supplies will go via western China, and subsequent transmission will go in the eastern direction via Siberia.[60]

Another trans-national gas pipeline that may become economically viable as China's gas market develops is the proposed extension of the West-East pipeline (from Xinjiang to Shanghai) to Turkmenistan, and from there possibly also to Iran and the Caspian Sea. CNPC and Mitsubishi first proposed to export Turkmen gas to China to Turkmenistan's president in 1992. During Li Peng's visit to Turkmenistan in 1994, CNPC and the Turkmenistan Ministry of Oil and Gas signed a letter of intent to establish a commission to study the pipeline. One year later, CNPC, Mitsubishi, and Exxon agreed to conduct a feasibility study, which they reportedly completed in 1996.[61] In July 2005 Turkmenistan and China again signed agreements on technical

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from Russia as a threat to China's energy and national security on the grounds that it would make China unnecessarily vulnerable to supply cutoffs during a regional or global crisis.

[59] 'TNK-BP and Buryatia Will Suggest Refining the East Siberia and Far East Development Program to the Ministry of Industry and Energy', INTERFAX, 1 June 2005, online at: http://www.tnk-bp.com/press/media/2005/6/1630.

[60] 'TNK-BP Welcomes the Agreement Between Gazprom and CNPC', 22 March 2006, online at http://www.tnk-bp.com/press/media/2006/3/1760

[61] Erica Strecker Downs 2000, *China's Quest for Energy Security* (Rand Corporation).

and economic cooperation, as well as loan agreements and a cooperation deal between the Turkmen Ministry of Oil and Gas and CNPC. Beijing has prioritized the energy sector in its economic cooperation with Turkmenistan. As of 2005 there were a total of 37 Chinese investment projects in Turkmenistan totalling $383 million, including 17 projects worth $221 million in the oil and gas sector.[62] However, these pipeline plans have so far not moved forward.

Turkmenistan is the largest natural-gas producer in Central Asia. Its gas reserves are estimated at some 5.5 trillion cubic meters of gas. Not surprisingly, Turkmenistan has been considering a number of alternative options to export its natural gas to Asian destinations, including China. One option is for Turkmenistan to export gas via a pipeline through Afghanistan and Tajikistan to China, and another is a proposed 1,400-kilometer trans-Afghan pipeline, which would transport gas from the Dauletabad field near the Iranian border to Pakistan, and could also be extended to India. However, the trans-Afghan pipeline, although much discussed, remains a utopian project, due to political conditions in the area. Dauletabad, as well as other Turkmen gas fields, is still hooked up to the old Soviet pipeline network, now controlled by Russian Gazprom. For Turkmenistan, a future export route to China or Pakistan would reduce its dependence on Russia.[63]

In late 2005 CNPC subsidiary PetroChina signed a gas agreement with the Burmese military regime, under which Burma's ministry of energy agreed to sell 6.5 TCF from A-1 block (Rakhine coastline) reserve through an overland pipeline to Kunming in China's Yunnan province for 30 years. The A-1 block is operated by the South Korean Daewoo International Corporation with a 60% stake. India's ONGC Videsh Ltd (OVL) holds a 20% stake and GAIL (India) Ltd another 10% interest in this block. KOGAS holds the remaining 10% stake. The end-user agreement with PetroChina came as a surprise to the Indian stakeholders, who had for several years negotiated plans for a Burma-Bangladesh-India gas pipeline.[64]

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[62] *Eurasia Daily Monitor* (Jamestown Foundation), 'Turkmenistan Explores Export Alternatives for its Natural Gas' by Sergei Blagov, 4 August 2005, online at http://www.jamestown.org/edm/article.php?volume_id=407&issue_id=3425&article_id=2370114

[63] Ibid.

[64] South Asia Analysis Group, Paper no. 1681, 19. 01. 2006 "Myanmar-Petrochina Agreement: A Setback to India's Quest for Energy Security",

All of these pipeline projects have their own problems, and do not necessarily provide energy security, although they would contribute to diversification. However, China's demand for oil and gas grows much faster than any realistic prospects of oil and gas provisions from Russia, Kazakhstan or Turkmenistan. Hence, even if these projects should be implemented, China's seaway import of oil and LNG will continue to grow significantly.

In addition to pipeline advances and the purchase of equity stakes, China has sought to promote energy security by strengthening its commercial ties and cross-investing with key exporting countries, including Iran, Sudan, Kazakhstan and Kuwait. The Chinese government has also invited state oil companies such as Saudi ARAMCO to invest in downstream oil and petrochemical infrastructure in China.[65] One of the reasons for Saudi and Kuwaiti investment in the upgrading and expansion of China's coastal refineries is that China has lacked refineries that can process 'sour' crude oil from the Persian Gulf, which has a higher sulphur content than China's domestic 'sweet' crude. As China is seeking to diversify its imports, Saudi Arabia and other Persian Gulf countries are also trying to diversify and secure their export markets; establishing a presence in China may be a key for them to developing long-term commercial ties that will secure their exports and reduce the US leverage. This could provide a basis for closer over-all ties between China and the oil-producing countries in the Middle East. It is interesting to see how China handles the current Iran crisis, which could make it a Middle Eastern player along with the USA, Russia and the major EU countries.

3.3 Preparing for an oil crisis

Oil security is at the top of China's energy policy agenda. In addition to its worldwide effort to diversify its sources of oil and to acquire upstream interests, the Chinese government decided in 2001 to build emergency petroleum stocks.[66] China has so far developed strategic petroleum reserves (SPRs) in four locations in Zhejiang,

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online at: http://www.saag.org/%5Cpapers17%5Cpaper1681.html

[65] Mikkal E. Herberg 2005. "Asia's energy insecurity, China and India: Implications fro the US", Testimony to the United States Senate Committee on Foreign Relations, July 26.

[66] Ibid.

Shandong and Liaoning provinces. According to plans, 22 million barrels will be filled in the first reserve by October 2006, and another 100 million barrel stock capacity will be ready by the end of 2008.[67] It should be emphasized that these stocks are crude oil, which would need to be refined at a time of crisis before they could reach the retail market.

The Chinese government is extremely concerned about how China would weather oil shocks similar to those of the 1970s.[68] Strategic oil reserves are meant to reduce China's vulnerability to short-term interruptions in oil supply, and help insulate the Chinese economy by stabilizing domestic oil prices in the event of dramatic price hikes on the international market. China's SPRs are also regarded as a deterrent against politically or economically motivated supply disruptions. Some Chinese analysts point out that SPRs will make oil-producing countries think twice about imposing an embargo or blockade against oil shipments to China. Chinese analysts have also argued that SPRs can increase China's diplomatic room to manoeuvre. Shielded from the adverse effects of a short-term supply disruption, China could also possibly feel free to take actions that, in the absence of strategic reserves, it would not find it advisable to pursue. The analysts do not specify what these activities might be, however, just arguing that if self-sufficient, China could assist other countries, increase its influence, and raise its international position.[69]

China's large foreign exchange reserves will also cushion the Chinese economy in the event of an oil crisis. Because China's trade surplus has been large over a number of years, the People's Bank of China has piled up huge amounts of US currency reserves. Until July 2005 the renminbi (yuan) remained pegged to the dollar, and has only appreciated moderately since then. This ensures that Chinese exports stay highly competitive on world markets. As of late February 2006 China's foreign exchange reserves reached $854 billion. Growing at about $15-17 billion per month, China's

[67] Ebel, Robert E., 2005. *China's energy future. (*Washington DC: CSIS Press): 18. Another source, Chietigj Bajpaee, 'China's Quest for Energy Security,' Power and Interest News Report (online at http://www.321energy.com/editorials/pinr/pinr022605.html) claims that Chinese SPRs contain 75 days of stocks, but this is probably a major overstatement.
[68] Erica Strecker Downs 2000. *China's Quest for Energy Security* (Rand Corporation).
[69] Erica Strecker Downs 2000. *China's Quest for Energy Security* (Rand Corporation), citing Zhao Hongtu and Li Rong YEAR: 26; Ma Hong and Sun Zhu YEAR: 47.

foreign exchange assets could top $1 trillion dollars by the end of 2006. According to US Treasury data China also held $262.6 billion of US Treasuries as of January 2006. The US trade gap with China hit a record $202 billion in 2005, whereas China's trade surplus with the rest of the world combined was only $102 billion, reflecting growing Chinese imports from many other countries.[70]

Analysts report that China has been gradually diversifying away from dollar assets in its foreign exchange reserves, but fears of a collapse in the US currency prevent it from making any dramatic shift. China has been a big buyer of US government bonds, helping to finance the US current account deficit and keep American interest rates low. Central bank chief Zhou Xiaochuan announced recently that China would adjust the mix of its reserves in light of global market conditions, according to criteria of 'safety, liquidity and profitability, in that order'.[71] Oil has so far been traded in US dollars in all major oil markets, although the euro has been used by some traders in Indonesia and was formerly used in Iraq. If more of the global trade in oil were to be conducted in euros, foreign exchange reserves in euros would also become more attractive. This would, however, not be desirable from the European point of view, since it would lead the euro to appreciate and thus cause difficulties for European exports.

The big question remains what China's position would be in an oil crisis. Its production costs would of course increase, but so would everyone else's, and China remains far less dependent on foreign oil than many of its competitors, notably Japan. Financially, China as a country is in a very strong position, although its banks and some of its companies may be more vulnerable. If China were to follow its own economic interests rather than a narrow security perspective, it would probably do its best to manage the crisis in co-operation with the USA, Japan and the other great powers. It is perhaps they who might, in an acute crisis situation, want to shut off China from oil supplies, in order to obtain Chinese political concessions and secure their own access to oil.

[70] http://www.census.gov/foreign-trade/balance/c5700.html#2005 (accessed 17 Apr 2006). http://news.bbc.co.uk/2/hi/business/4602126.stm (accessed 17 Apr 2006).
[71] 'Senior China Official Urges Cut in US Debt Holding' by Kevin Yao and Benjamin Kang Lim, Reuters, 4 April 4 2006.

3.4 The military dimension

There have been numerous indications of growing tension, in East Asia in particular, due to the increased role of energy security in international relations in recent years. For instance, China has been involved in several energy-related controversies with neighbouring countries. Current disagreements between Japan and China are linked closely to oil resources in disputed areas of the South and East China Sea. In 2005 China deployed warships near a gas field in the East China Sea, in an area that is disputed by China and Japan.[72] The warships appeared two days before a general election in Japan, whose results could influence relations between Asia's two great powers, and weeks before China was scheduled to start producing gas in the area, despite strong Japanese protests. In line with its customary approach to all of its offshore territorial disputes, China previously offered to jointly exploit the energy resources in the area, but Japan refused, asking China to share seismic data and freeze its plans to begin pumping gas. The Japanese government has also granted a Japanese company, Teikoku Oil, the rights to test-drill in disputed waters. In the disputed Spratly area of the South China Sea, China has managed to persuade the Philippines and Vietnam to engage in joint exploration of resources.

The production potential in the disputed areas of the East and South China Sea is probably quite limited, and will not in the short term have any impact on China's energy security. LNG imports from Malaysia and Indonesia will probably be far more important. Yet the current oil price is likely to enhance the willingness of various funders to finance oil exploration in disputed waters, leading to a risk of more conflict, notably if a major discovery should be made.

The Chinese government recognizes that the bulk of China's imports will continue to come from the Middle East and is concerned about supply disruptions in this politically volatile region. Chinese analysts think that the establishment of viable alternative sources of supply, such as Central Asia and Russia, or possibly offshore oil or gas fields, could reduce China's vulnerability to embargoes or blockades of Middle

[72] 'China deploys ships to area Japan claims. Tensions rise as fleet of warships appears near disputed gas field just days before election and a few weeks before drilling is to begin' - Norimitsu Onishi, Howard W. French, *New York Times*, September 11, 2005.

Eastern oil supplies.[73] China does not and will not in the foreseeable future possess the naval capabilities necessary to protect its sea shipments of oil from distant countries and, consequently, regards their passage through waters dominated by the US, Indian and Southeast Asian navies as a key strategic vulnerability. This could be mitigated either through rivalry or cooperation with these navies, notably in securing the Malacca Straits. China's need to secure its supply of oil from the sea at a time of crisis may also be one of the rationales behind the modernisation of its naval forces, as well as the deployment of a great number of short to medium range missiles along the Taiwan strait. These are meant not only to deter Taiwan from seeking independence, but also to deter foreign navies from entering Chinese waters.

[73] Erica Strecker Downs 2000. *China's Quest for Energy Security* (Rand Corporation), citing "Oil Security Risk, Wolf at the Door?" *China Oil, Gas and Petrochemicals*, Vol. 5, No. 10, 15 May 1997: 2; "Key Issues of Energy Development Strategy," Guoji shangbao (*International Business Daily*), 14 July 1998: 6, in Foreign Broadcast Information Service (FBIS).

4. India's energy needs

4.1 India's energy mix

According to the statistics of the US Energy Information Administration, the Indian energy mix is comprised of: combustible renewables and waste (38.2%), coal (33.2%), oil (22.4%), gas (4.2%), hydro (1.2%), nuclear (0.8%), geothermal, solar and wind (0.1%). This reflects India's relatively low level of economic development (although it may also have to do with differences in reporting). If its current economic growth continues, India will see 'Chinese developments' with a reduction in the role of combustible renewables and waste, and a rapid increase in the consumption of coal and oil, as well as the promotion of renewable energy sources such as geothermal, solar and wind. If India's current energy policy is vigorously pursued, we are also likely to see a further boost to the importance of natural gas and nuclear power.

The US DoE provides the following key statistics on India's energy reserves, production and consumption:[74]

Proven Oil Reserves (1/1/2005)	5.4 billion barrels
Oil Production (2005)	0.84 million barrels per day (bbl/d)
Oil Consumption (2005)	2.52 million bbl/d
Crude Oil Refining Capacity (2005)	2.25 million bbl/d
Natural Gas Reserves (1/1/2005)	30.1 trillion cubic feet
Natural Gas Production (2003)	1 trillion cubic feet
Natural Gas Consumption (2003)	0.957 trillion cubic feet
Recoverable Coal Reserves (2003)	101.9 billion short tons
Coal Production (2003)	0.403 billion short tons
Coal Consumption (2003)	0.430 billion short tons

On the composition of energy sources used in electricity generation, the IEA provides the following figures from 2003:[75]

[74] DoE, India Country Analysis Brief, December 2005.
[75] IEA energy statistics online at http://www.iea.org/Textbase/stats.

Production from:	*Unit - GWh*
Coal	432799
Oil	29084
Gas	72802
Nuclear	17780
Hydro	75339
Solar PV, biomass & other	5471
Total production	633275

By production source, India's electricity generation is derived from: coal (68.3%), hydro (11.9%), gas (11.5%), oil (4.6%), nuclear (2.8%), and solar PV, biomass and other sources (0.9%). Compared with the situation in China, gas plays a surprisingly prominent role in Indian electricity production.

India is now the world's sixth largest energy consumer, and the third largest oil and gas consumer in Asia, after China and Japan. Since 2002 several major gas finds have been made that have the potential to supplement the country's dwindling oil reserves. Despite this, Indian domestic gas production is not sufficient to cover a significantly increasing demand, and India began importing gas in 2004.[76] As of 2005 India produced about 90 million standard cubic meters of natural gas per day. IEA projects a demand of natural gas at the level of 400 million standard cubic meters a day in 2020. Compressed natural gas consumption for vehicles is expected to reach 5% of total consumption already in 2010 and India has ambitious plans for city gas projects. The share of gas in India's energy mix is expected to increase sharply, and grow to 20% by 2025.[77] Despite its major gas finds, India is likely to import 30-40% of the gas it uses. The key challenge for rapid development of the gas sector is the capacity of Indian power generators to pay market-based gas prices, which in turn depends on vigorous implementation of power sector reform.[78]

[76] Findings of recent IEA work, available online at www.iea.org/textbase/nppdf/free/2005/findings.pdf
[77] 'ONGC in talks with Gazprom for $20-billion investment', 23 February 2006, *The Financial Express*, Moscow.
[78] Findings of recent IEA work, available online at www.iea.org/textbase/nppdf/free/2005/findings.pdf

The contrast between the developing gas sector and the stagnant coal sector is stark. India's coal consumption in 2003 was 0.43 billion short tons, comprising about 8% of the world total. With significant coal reserves, estimated at 102 billion short tons, India is the world's third largest coal producer, after the USA and China.[79] The Indian government controls almost all coal production, which has been plagued by low productivity, distribution problems, and an increasing loss of market shares to imported coal that is both less expensive and of higher quality. Nearly all of India's 390 mines are under Coal India Ltd. (CIL), which accounts for about 90 percent of the country's coal production. Current policy allows private mines only if they are "captive" operations which feed a power plant or factory.[80]

4.2 Oil

Just like in China, India's oil production has stagnated – its production of crude was 632,000 bbl/d in 2005. Its oil consumption, however, has grown by over 6% annually during the past decade, twice the world average growth, and reached 2.5 million bbl/d in 2005. This has meant a drastic increase in oil imports, which represented 68% of total consumption (1.7 million bbl/d) in 2005, of which about half came from the Middle East.[81] The US Department of Energy (DoE) as well as the IEA expect an annual growth of 4% in Indian oil consumption over the next decades, rising from a current 2.1 mb/d to 5.3 mb/d in 2025. According to their projections imports will account for 85% of total Indian oil consumption by 2025, most of which will need to be imported from the Middle East, with the balance from Central Asia and Africa.[82]

Indian analysts estimate that India's oil demand will increase even faster, leading to the depletion of all of India's current proven oil reserves by 2020. Unless new discoveries are made, India will then end up in a Japanese situation, with total dependence on imported oil.[83]

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[79] DoE, South Asia Overview Country Analysis Brief, March 2006.
[80] DoE, India Country Analysis Brief, December 2005.
[81] Mikkal E. Herberg 2005. "Asia's energy insecurity, China and India: Implications for the US", Testimony to the United States Senate Committee on Foreign Relations, July 26.
[82] Ibid.
[83] Chudamani Ratnam, "The future of petroleum: An Indian perspective", paper presented at the 7th Asian Security Conference, New Delhi, January 2005. The author is former chairman of Oil India Ltd.

4.3 Transportation

In 2002 gasoline consumption in India reached 170,000 bbl/d, refinery output was 242,000, and exports amounted to 55,000 bbl/d. As for jet fuel, in the same year consumption reached 49,000 bbl/d, refinery output amounted to 66,000 bbl/d, and exports of jet fuel totalled 15,000 bbl/d.[84]

As of 2003 the total number of registered vehicles in India was 670 million, of which 47.5 million two-wheelers, 8.6 million cars, jeeps and taxis, 3.5 million goods vehicles and 0.7 million buses.[85] According to statistics provided by the Ministry of Road Transport & Highways, Government of India, the annual rate of growth of motor vehicle population in India has been about 10% during the last decade. However, in 2004, no more than one million new cars were sold in India, so India remains far behind China in terms of amount of fuel consumed by cars and aircraft.

4.4 Electricity generation

According to DoE projections Indian electricity demand is expected to rise by 150% over the next 25 years. Coal fuels nearly 70% of the electricity production today, and coal consumption is expected to increase by 70% over the same 24 years. Despite a continued reliance on coal as the main power generating fuel, Indian gas consumption for electricity generation is expected to triple in the same period. India is also looking to nuclear power development as an important source of electricity generation, although nuclear power accounts for less than 3% of electricity production today. At least five new nuclear plants are planned, which would triple nuclear power generation from 3 to 9 GW.[86] During President George W. Bush's visit to New Delhi in March 2006, he signed a highly publicized agreement with India to facilitate cooperation in the field of nuclear power generation. It was presented in terms of a 'strategic partnership'. If ratified by the US Senate, it could pave the way for US sales of nuclear fuels and nuclear reactors to India, which could help India increase the nuclear share of electricity generation.[87]

[84] Latest EIA Detailed Annual Data, at http://www.eia.doe.gov/emeu/world/country/cntry_IN.html
[85] Ministry of Shipping, Road Transport and Highways, Government of India, online at: http://morth.nic.in/
[86] Ibid.

As of 2003, total generating capacity in India was 126 GW. India generates approximately 83% of its electricity from conventional thermal power plants and around 12% from hydroelectric plants, located mainly in the north and northeast of the country. The country is facing serious power supply problems, with the Indian government citing current generation at 30% below demand. Although 80% of India's population has access to electricity, power outages and brownouts are common.[88]

[87] DoE, India Country Analysis Brief, December 2005.
[88] DoE, South Asia Overview Country Analysis Brief, March 2006.

5. India's energy security

Energy security has emerged as a new cornerstone of India's foreign policy. India has adopted a four pronged approach to energy security, which includes import source diversification and acquisition of equity oil, the building of strategic petroleum reserves (SPRs), increased domestic exploration, and production and fuel diversification.[89] As this suggests, India's energy security strategies are similar to those of China, including import source diversification, production and fuel diversification, and the build-up of SPRs as stated strategic goals. Section three below will describe strategic oil reserves, section two will cover import source diversification, while section one will outline measures to enhance energy efficiency and fuel diversification, with a focus on efforts to develop the natural gas sector.

5.1 Energy efficiency and diversification

India has recently entered a new era in its gas industry with large discoveries of indigenous gas and the arrival of the first liquefied natural gas (LNG) tanker in January 2004. India will continue to import LNG in the short to medium term to close its demand gap, and is already moving to develop the necessary infrastructure. Projects are ongoing to boost India's LNG import capacity five-fold within 10 years. In total the Indian government has approved plans for altogether 12 new import terminals. India needs to almost triple its existing pipeline capacity for gas over the next five years in order to connect the new LNG terminals with consumers and to transport gas from its recently discovered domestic fields.[90]

The largest state sector gas projects are to be conducted by Petronet, a joint venture between ONGC, Indian Oil Corporation (IOC), GAIL, the National Thermal Power Corporation (NTPC), and Gaz de France. Petronet is responsible for two import terminals, one at Dahej and the other at Kochi. The terminal at Dahej began operation in late 2003, importing gas from Qatar. After several delays, Petronet is planning to solicit bids for its second terminal at Kochi in early 2006, with completion by 2009. Shell also has begun construction of an LNG import terminal at Hazira in Gujarat, and has contracted for LNG supplies from Oman. The facility began operation in

[89] Findings of recent IEA work, available online at www.iea.org/textbase/nppdf/free/2005/findings.pdf
[90] Findings of recent IEA work, available online at www.iea.org/textbase/nppdf/free/2005/findings.pdf

November 2004. Like the Petronet Dahej terminal, it is to be linked into existing natural gas pipelines.[91]

As a part of the Indian government's response to the 1973 oil crisis the Petroleum Conservation Research Association (PCRA) was set up in 1976 to make recommendations for conserving petroleum products in various sectors of the economy. The PCRA was entrusted with the task of sponsoring R&D activities for the development of fuel-efficient equipment/devices. The oil marketing companies have also been making efforts to promote oil conservation, and a conservation cell has been established within the Ministry of Petroleum and Natural Gas.[92] However, none of these measures seem to have had much effect.

In 2001 India's energy efficiency (energy consumption per dollar GDP) stood at 25,307 Btu in 1995. This made India one of the least energy efficient countries in Asia, surpassed only by Pakistan (26,229 Btu) and the extremely inefficient China (35,619 Btu). India's low level of energy efficiency is due in large part to the growth of unproductive energy-intensive industries during its economic expansion, coupled with the virtual absence of measures to enhance energy efficiency and conservation.[93]

The Energy Conservation Act of 2001, implemented by the Bureau of Energy Efficiency (BEE) under the Ministry of Power, promotes the training of energy managers and auditors in energy management, project management, financing and implementation of energy efficiency projects[94] While China is much less energy efficient than India, and India has a much longer record of promoting energy conservation, the current Chinese energy efficiency campaign, under the leadership of the country's two top leaders, is likely to generate more impressive results than the corresponding campaigns in India.

[91] EIA India Country Analysis Brief, December 2005, online at: http://www.eia.doe.gov/emeu/cabs/India/Background.html
[92] http://petroleum.nic.in/conpcra.htm
[93] http://www.eia.doe.gov/emeu/cabs/indiaenv.html

5.2 Securing imports and developing strategic alliances

In recent years India has proved willing to take on the political and financial risks inherent in overseas investments; just like China it has become a major player in the international oil and gas industry. Observers have concluded that India is emulating China in its overseas energy security strategies.[95] By improving ties with resource rich countries, India hopes to enhance its energy security. Indian oil and gas companies are thus encouraged to invest overseas and to build strong relations with strategically important countries. In addition to upstream investments, India has entered into agreements on energy cooperation with several countries, including a 'strategic energy partnership' with Saudi Arabia. Like China, India apparently seeks 'niche markets' that have remained off limits to more politically sensitive multinational oil companies.[96]

India receives more than 50% of its imported oil from the Middle East, and has a great interest in diversifying its sources of oil. India's major state-owned oil company is ONGC (Oil and Natural Gas Corporation), which has an international subsidiary, ONGC Videsh Ltd. (OVL). ONGC stands for 77% of India's crude oil and 81% of its natural gas production, and is currently the most profit making corporation in the country.[97]

During the past few years, India's public sector oil companies such as ONGC and IOC have made successful bids in oil exploration and production deals in a number of countries, including Australia, Egypt, Iraq, Iran, Ivory Coast, Libya, Burma, Syria and Central Asia. Since it started looking abroad in 2001 ONGC has acquired interests in at least 14 oil and gas projects in eleven countries around the world. The largest stakes so far are the company's 25% share of the Greater Nile Oil Project in Sudan, in which CNPC is the majority stakeholder, and a 20% share of the Sakhalin 1 project in Russia, led by ExxonMobil.[98] In December 2005 OVL completed a 741 km multi-product

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[94] See http://www.energymanagertraining.com/new_index.php
[95] Mikkal E. Herberg 2005, "Asia's energy insecurity, China and India: Implications fro the US", Testimony to the United States Senate Committee on Foreign Relations, July 26.
[96] Findings of recent IEA work, available online at www.iea.org/textbase/nppdf/free/2005/findings.pdf
[97] http://encyclopedia.thefreedictionary.com/ONGC
[98] Mikkal E. Herberg 2005, "Asia's energy insecurity, China and India: Implications fro the US", Testimony to the United States Senate Committee on Foreign Relations, July 26.

pipeline linking Khartoum Refinery to Port Sudan.[99] Among OVL's exploration assets are a 100% share of Iraqi Block 8, a 100% share of Qatar's Najwat Najem, a 70% share of Egyptian North Ramadan and a 49% share of Libyan NC 188 and 189.[100]

This record seems impressive, yet according to a Reuters report,[101] despite that ONGC has acquired minority shares in projects such as Sakhalin 1, Iran's Yadavaran oilfield and Sudanese properties abandoned by Western investors, the company has yet to take a lead role in any concession. The Indian government would like to see ONGC boost its reserve-to-production ratio, or the number of years its reserves will last with the current level of output, by improving its drilling technology and management practices. ONGC's ratio is currently at 22 years.[102]

To help meet its growing demand for gas imports India has also acquired overseas gas production assets, in Vietnam and Burma. OVL currently holds a 45% share in the Vietnamese Block 6.1 (where Statoil used to have a share), which produces 7.5 million standard cubic meters of gas per day. Together with Korean companies Daewoo International and KOGAS, the Indian companies OVL and GAIL (Gas Authority of India Limited) are also stakeholders in the Burmese offshore Shwe gas field.[103]

OVL has further been negotiating with Russia's Gazprom over a string of major oil and gas deals, involving the production and shipping of gas, as well as petrochemicals and oil. The two companies have signed a memorandum to jointly develop energy projects in India, Russia and other countries. One of the planned projects involves gas production in the Russian Sakhalin, and building LNG facilities on the Pacific coast.[104]

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[99] 'OVL- built Sudan Pipeline dedicated to the people of Sudan', New Delhi, December 10, 2005, online at: http://www.ongcvidesh.com.
[100] http://www.ongcvidesh.com.
[101] Cited by http://encyclopedia.thefreedictionary.com/ONGC
[102] http://encyclopedia.thefreedictionary.com/ONGC
[103] http://www.shwe.org/about/
[104] 'ONGC in talks with Gazprom for $20-billion investment', 23 February 2006, *The Financial Express*, Moscow.

India has also explored the more distant possibility of participating in the construction of a trans-Afghan pipeline from Turkmenistan to Pakistan, with a possible future extension to India. This idea does not, however, appeal to the Russians, whose giant company Gazprom in 2003 signed a framework agreement on gas cooperation with Turkmenistan. The latter pledged to supply up to 100 billion cubic meters of gas per year to Russia from 2010 onward. Although Turkmenistan halted gas supplies to Russia in late 2004, in order to back a demand for a higher price than the one originally agreed, Gazprom did not yield. By clinging to the deal to buy virtually all of Turkmenistan's gas, Moscow also sought to remove any illusions that the trans-Afghan pipe dream could be realized.[105]

Another option that has been much discussed in India is to build a pipeline from Iran, either through Pakistan or along the coast on the seabed. Concern for price, physical underwater geography and politics, however, makes this option only slightly more realistic than the trans-Afghan pipeline. Whereas Iran and Pakistan are reported to be proceeding with the pipeline plan, India has been reluctant to join. If relations between India and Pakistan were to be further improved, however, this might make it possible to extend the Iran-Pakistan pipeline to India at some point in the future. Until energy security and political tensions surrounding pipeline gas imports are resolved, it is likely that all of India's gas imports will continue to be in the form of LNG.[106]

5.3 Preparing for an oil crisis

In early 2004, the Indian cabinet approved a plan for the establishment of an SPR to provide an emergency response mechanism against short-term disruptions of oil supplies. The Indian government has consulted the IEA on its proposal, and has declared its intention to adopt IEA standards for strategic oil stock deployment.[107] According to IEA sources, SPRs amounting to 15 days of oil import coverage are supposed to be in place by late 2007.

[105] *Eurasia Daily Monitor* (Jamestown Foundation), 'Turkmenistan explores export alternatives for its natural gas' by Sergei Blagov, 4 August 2005, online at www.jamestown.org/edm/article.php?volume_id=407&issue_id=3425&article_id=2370114
[106] Ball, Schneider, Fairhead, Short, 2004, 'The Asia Pacific LNG market: issues and outlook', ABARE research report 04.1, online at www.nautilus.org/aesnet/2005/MAY0405/APEC_LNG_MARKET.pdf
[107] IEA-India Joint Workshop on Emergency Oil stocks, New Delhi, India, January 2004.

India also needs financial means to weather an oil crisis. India's foreign exchange reserves stood at a solid $144 billion as of December 2005, mainly in the form of foreign currency assets.[108] However, India's external debt was at a similar level, and its trade deficit during the first seven months of 2005–2006 amounted to $23.51 billion. In 2004–2005, oil imports cost India $29.08 billion, whereas non-oil imports in the same period were estimated at $77.036 billion.[109] Oil thus made up nearly 38% of India's total import expenditure that year.

5.4 The military dimension

Nearly 89% of Indian oil imports arrive by sea; securing sea lanes of communication (SLOCs) is therefore a prime objective of Indian naval and maritime strategy. In this respect, India is favoured over China both by its proximity to the Middle East and by its larger navy. To further its capacity to monitor SLOCs in the Indian Ocean, India is currently planning to set up a high-tech monitoring station in northern Madagascar. According to analysts, the expansion of Indian maritime intelligence in the Indian Ocean is as much about keeping an eye on the mounting Chinese presence in the Bay of Bengal, its growing intimate relations with Bangladesh and Burma, and its entrepreneurial activities in Pakistan's south-western Makran coast of Balochistan, where Chinese businesses are involved in the Gwadar Port project.[110] Gwadar is almost at the mouth of the Persian Gulf, 72 km from Iran, and about 400 km from the Strait of Hormuz. The Gwadar project commenced in March 2002, and reports claim that China has contributed a significant part of the estimated $1.16 billion cost of the port.

Indian analysts are not only apprehensive of China's presence in the Indian Ocean, but are also interested in the positive aspects of China's energy security strategies,

[108] According to Reuters, India's external debt was $124.3 billion at the end of September 2005, whereas its foreign exchange reserves were nearly $144 billion, exceeding external debt by about $20 billion and enough to cover around 13 months of imports.
[109] Reserve Bank of India, Annual report 2004-2005.
[110] Sudha Ramachandran, 'Delhi all ears in the Indian Ocean', *Asia Times* online, 3 March 2006.

especially their 'military dimensions'. Citing international media reports, one analyst states:[111]

> China is planning an aggressive maritime strategy that includes a presence in the Persian Gulf/Indian Ocean area and may even venture to replace the USA as Saudi Arabia's patron. Unconfirmed reports suggest that Chinese troops may already be in place in Africa allegedly to serve armaments sold in exchange for oil. […] The westernmost borders of China are not too far from the Middle East and Central Asian oil and gas fields and the Chinese will quite probably make military moves on land also to secure these resources. […] Various countries of the Asian region are seeking petroleum exploration and production licenses in different parts of the world. While plans to establish captive production are laudable the likelihood is that in relation to the growing demand these will only add insignificant amounts as the most prolific areas are under state control with American/European patronage. Besides this oil is not free any more than a foreign concessionaire in India is getting after taxes, royalties, etc. Most importantly any large discovery will always be under threat of nationalization unless there is a military dimension, such as China is trying to establish.

India is in a much better position than China to secure its sea lanes of communication. On the other hand, India must overcome even more serious geopolitical and security challenges than China before it can realize its overland pipeline dreams. Surrounded by a less than friendly Pakistan, a restive Nepal and deadlocked Sri Lanka, a suspicious Bangladesh and a thoroughly unreliable Burma, India has not so far been able to see any of its pipeline dreams being fulfilled. The problems with the proposed trans-Afghan pipeline and the pipeline to India from Iran are not just the notorious political instability of Afghanistan and the Balochistan region of Pakistan (bordering Afghanistan and Iran), but also the unresolved issue between India and Pakistan over Kashmir.

[111] Chudamani Ratnam 2005. "The future of petroleum: An Indian perspective", paper presented at the 7th Asian Security Conference, New Delhi, January.

6. Cooperation or controversy?

6.1 Sino-Indian energy cooperation

India and China are among the world's fastest growing oil consumers, and depend increasingly on imported oil, mainly from the Middle East. In addition to buying more and more oil on the open market the two countries' state-owned oil companies have been rivalling each other, and the established international oil companies for contracts to produce oil in many countries. In Angola for instance, a Chinese company outbid India's and acquired a 50% stake in BP-operated Block 18 in 2004, purchased from Shell.[112] In an effort to avoid rivalry over production contracts, which has certainly driven up the prices, India in 2005 took the initiative to develop energy cooperation with China. A dialogue between India's Minister of Petroleum and Natural Gas Mani Shankar Aiyar and China's Vice Chairman Zhang Xiaoqing began at the Asian Round Table in New Delhi, January 2005. In the following month, India's Petroleum Minister called for a pan-Asian gas grid at the Third Asia Gas Buyers Summit in New Delhi. His proposal was welcomed by the Chinese delegates to the summit.

The dialogue on energy cooperation was further strengthened during Chinese Premier Wen Jiabao's visit to India in April 2005. The prime ministers of the two countries then issued a joint statement on their agreement to cooperate in the field of energy security and conservation, including, among others, encouraging relevant departments and units of the two countries to engage in the survey and exploration of petroleum and natural gas in third countries. Several bilateral discussions on the agreed energy cooperation took place during the following months. In July 2005 researchers met to discuss 'Sino-Indian Energy Cooperation' in Chengdu. In August 2005 China hosted a week-long visit by a delegation of Indian officials and representatives of oil companies, for the purpose of exploring possible cooperation with their Chinese counterparts.

While these events were taking place, however, ONGC was outbid by CNPC in a competition to acquire Canadian oil company PetroKazakhstan, which has some 550

million barrels of reserves in the Turgai basin region of Kazakhstan. These are the second largest Kazakhstani proven reserves after ChevronTexaco's Tengiz oil field. In recent years PetroKazakhstan has seen considerable conflict with the government of Kazakhstan, including a fine for anti-competitive behaviour and protests of its environmental and labour record reportedly organized by government agents. In August 2005 it was announced that CNPC agreed to buy the company for $4.18 billion, making the PetroKazakhstan deal the largest overseas acquisition by a Chinese company to date.[113] According to a Reuters report, ONGC was 'humbled by China's CNPC in the high-profile race to acquire PetroKazakhstan, which the Indian company says it lost narrowly'. The report further states that: 'Mr Aiyar has pushed for Indian and Chinese firms to cooperate, not compete, for overseas assets, but his efforts appear to have met with little interest in Beijing, where the oil majors are gaining ground abroad, despite some hiccups.'[114]

In January 2006 Indian Petroleum Minister Mani Shankar Aiyar and China's National Development and Reform Commission Chairman Ma Kai signed a bilateral hydrocarbon cooperation deal under which they agreed to create a framework for joint bids for the acquisition of oilfields in third countries. According to a statement issued by the Chinese embassy five memoranda were signed, covering a full scope of areas, including strengthening the exchange of information when bidding for oil resources in a third country, upstream exploration and production, refining and marketing of petroleum products and petrochemicals, the laying of national and trans-national oil and gas pipelines, frontier and cutting-edge research and development, and promotion of environment-friendly fuels.[115] The agreement paved the way for five state-owned oil companies in the two countries to 'begin the process of operational cooperation'.[116]

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[112] Although India's OVL signed an agreement with Shell to buy a 50% stake in Block 18 in April 2004, Sonangol refused to approve the purchase, and accepted a bid coupled with a $2 billion aid offer from China in October 2004. See EIA's Angola Country Analysis Brief.
[113] http://encyclopedia.thefreedictionary.com/PetroKazakhstan
[114] http://encyclopedia.thefreedictionary.com/ONGC
[115] 'China, India agree on energy cooperation' Embassy of the People's Republic of China in the United States of America, 13 January 2006.
[116] 'India, China move to energy cooperation', United Press International, 13 January 2006.

What are the tangible results of this cooperation so far? The main result is that Indian and Chinese oil companies have started to cooperate in purchasing shares in oil exploration in third countries. In February 2006 a 50:50 joint venture company (Himalaya Energy, Syria) covering 36 production fields in Syria was set up by subsidiaries of OVL and China's CNPC International, purchasing the entire production shares of Canadian oil company Petro-Canada. OVL and CNPC have also previously worked together on the Greater Nile Oil Project in Sudan, but the Syrian purchase was the first time that the two companies joined forces to acquire an oil asset. The remaining recoverable reserve potential of the asset is estimated to be more than 300 million barrels of oil.[117]

According to one Indian analyst, the stage is set for the two countries to make more joint oil bids.[118] Citing a report in the *Economic Times*, Indian oil companies, including downstream marketing companies like the Indian Oil Corporation, BPCL, OVL and Prize Petroleum, are set to ink agreements with China's Sinopec, CNOOC and CNPC, for collaboration in the exploration, petroleum and gas sectors. Other observers have been more sceptical. According to the *Financial Times,*[119] Beijing-based energy consultant James Brock stated that the deal to exchange information before bidding for fields in third countries 'may be possible, but it is highly improbable and even less practical'. Another consultant responded that: 'It is one of these agreements that governments sign. But when it comes to the hard practice they don't help each other'. A complete lack of cooperation between China and India was evidenced when PetroChina signed a deal with Burma in late 2005 on building a gas pipeline to China, interrupting a long-negotiated Burma-Bangladesh-India pipeline project. This was a major setback for Indian policymakers as well as oil and gas companies. It was also evidently noticed in Beijing that many commentators saw the March 2006 US-Indian agreement on nuclear power cooperation as a 'strategic alliance' aiming to contain China.[120]

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[117] 'ONGC acquires shares of Petro-Canada in Syria', New Delhi,December 21, 2005, and 'ONGC completes transaction of acquisition of producing asset in Syria' New Delhi, February 01, 2006, online at: http://www.ongcvidesh.com.
[118] Asia Times Online, 'India, China pin down $573m Syria deal', by Indrajit Basu, 22 December 2005.
[119] 'Cynicism greets Sino-Indian deal to end rivalry over oil supplies', *Financial Times*, 15 January 2005.
[120] Stein Tønnesson 2006. "Regionale stormakters globale rolle: Kina, India, Brasil og Sør-Afrika." *Internasjonal politikk* 64/1: 75-94 (92-93).

Whether the two countries will do more to 'help each other' in the future is perhaps less of a question than who will take the lead in the cooperation. This was already evident with the signing of the mid-February 2006 joint energy deal with Iran on the Yadavaran oil field, under which Sinopec acquired a 51% stake in the field, and ONGC only 29% (This happened shortly before President Bush's highly publicized visit to New Delhi.). According to the agreement Sinopec will develop the field, and China will purchase ten million tons of LNG from Iran per year, for 25 years beginning in 2009.[121] This will probably not be the last agreement where India is forced to take a 'back seat' position vis-à-vis China.

6.2 Diversifying imports

The energy needs of China and India will continue to influence their foreign policies and the strategic ties they forge with other countries. China and India have been fostering ties with oil-rich countries all over the world, but especially with less developed countries where their state-controlled oil companies have a chance to compete with the multinational companies. It is evident that Chinese and Indian companies are willing to take relatively high risks when dealing with 'unsavoury' regimes, but they are also forced to do so for lack of better alternatives. In other words, when China and India are diversifying their supply sources this is not only due to concerns about the stability of the Persian Gulf and the security of SLOCs, but also in response to the fact that 'the most prolific areas [i.e. the Arabian peninsula and now also Iraq] are under state control with American/European patronage'.[122] Due to this 'patronage' and the dominant role of the US in the Persian Gulf, China and India seem equally unwilling to place their full trust in the market.

A significant factor in the 'conflict or cooperation' equation is the trend towards a greater politicization or securitization of energy, and especially oil. Increasingly, the question of reliable oil and gas supplies has become a matter of national security, and as a consequence energy security has become a core issue on many countries' foreign

[121] Power and Interest News Report, 'Iran's nuclear plans complicate China's energy security', by Michael Piskur, 13 March 2006.
[122] Chudamani Ratnam 2005, "The future of petroleum: An Indian perspective", paper presented at the 7th Asian Security Conference, New Delhi, January.

policy agenda, and a key issue in forums such as the EU, OECD and G8. Many of the world's leaders, including Vladimir Putin (Gazprom's 'future CEO'), George W. Bush and Condoleezza Rice (director of Chevron until 2001) have close ties to their country's oil and gas industries, and it is evident that national interest plays a certain role in how most countries' energy companies operate. Many companies are state-owned, and those that are not are eagerly cultivating ties both with their own and foreign governments, trying to influence the formulation of energy policies. OPEC also still has a significant role to play in trying to stabilize the oil price. All of this makes for an imperfect global energy market. Due to the significant role played by many independently operating state-owned oil companies, and the fact that it is long since the oil market was dominated by five Western oil companies, there are sufficiently many independent actors to ensure that prices are set through competition. On the other hand, since the main oil producing states have monopolized their oil production, and since some of the countries with the largest oil reserves are politically unstable, there is not sufficient competition for access to the most lucrative oil concessions to ensure a normally functioning market. Political conditions in the Middle East make for a volatile, imperfect market because the oil that is cheapest to produce is not open to competitive investment. The result is a highly insecure, fluctuating price structure, with political risks playing a major role in influencing the market price. In view of this, the cost and security of transportation is not necessarily the main factor in influencing China and India's energy security. The most important factor is Middle Eastern politics. This is no doubt one of the reasons why China and India are both trying so hard to diversify their imports, and sign bilateral deals with specific countries both in and outside of the Middle East.

6.3 Taking oil off the market?

The increasing dependence of China and India on imported oil and gas, and the way the two countries cope with this situation, has global ramifications. A much-debated question is how to judge Chinese and Indian efforts to 'lock up' oil resources by purchasing oil fields and acquiring equity oil, signing contracts on exclusive extraction or import rights, and other means of 'taking oil off the world market', if this is what they are doing. Only if the state-owned companies that acquire equity oil are willing or obliged to provide the oil to their home market at below-market prices

may these deals be said to 'take oil off the market'. Otherwise the market mechanism is still at play, and if the companies are registered on the stock market, the penalty for selling their assets below the market price will be huge. The eternal threat to companies buying equity oil is of course nationalization in the supplying country, which in turn could make military means of controlling, or threatening, these countries an important factor, as Indian analysts have pointed out. The fact that the highly volatile oil market, and that no government or organization (except to some extent OPEC), sets the oil price, in no way precludes the possibility that a country in a crisis situation might be willing to go to war for oil. The US concern to prevent any country from gaining control of the Persian Gulf area has always played a major role in US Middle Eastern policy, and was no doubt a major factor behind the 2003 invasion of Iraq, just as it plays a major role in US policies towards Iran today.[123] The risk of a resource war with its origin in Middle Eastern developments, should in no way be dismissed, and both risk of war and actual war may have a major impact on the energy security of China and India, just as for that of other oil importing countries.

Rising friction between China and the US over oil and energy deals made by Chinese oil companies is another issue of concern. Since 2003 China has sought energy and mineral deals with Iran, whom the US and the major EU countries are determined to prevent from developing a full fuel-cycle nuclear power programme, with Sudan, accused of genocide in the Darfur region, and with Venezuela, whose president has a highly difficult relationship to the US, and works closely with Cuba. US officials Deputy Secretary of State Robert Zoellick and the State Department's former chief China official Randall Schriver warned in September 2005 that China and the US are on a 'collision course' over the ties Beijing is forging in its search for energy security.[124]

This kind of rhetoric, described by Michael Klare as 'revving up the China threat',[125] leaves much unsaid. A forceful counterargument to the theory of a 'collision course' between China and the US is that China is in fact helping to bring much-needed oil

[123] Øystein Noreng 2006. "USA, Midtøsten olje og Kina."*Internasjonal politikk* 64/1: 95-122; Øystein Noreng 2006. *Crude Power: Politics and the Oil Market* (London: I.B. Tauris).
[124] 'US warns China on Iran oil', Reuters online, 7 September 2005
[125] 'Revving up the China Threat', *The Nation*, by Michael T. Clare, 24 October 2005.

and gas into the world market by investing in 'no-go' countries such as Sudan and Burma.[126] According to a report to the American Congress prepared by the DoE last year, China's willingness to pull oil from places others avoid means that the world market is better supplied, thus reducing oil prices and benefiting consumers.[127] In this respect, China has a key interest in common with all other oil consuming countries, rather than a conflicting agenda, and the same goes for India. This common interest is subject, of course, to the degree to which Chinese and Indian investments supplement rather than replace investments by other companies.

It is also important to consider the exceedingly tight-knit nature of commercial ties between the US and China, which is evident in the oil and gas sector as well. A number of American oil companies have stakes in Chinese public sector oil companies and their subsidiaries, and/or cooperate on exploration and related projects. Despite the fact that the US Congress blocked the CNPC's attempt to take over Unocal there are signs that commercial cooperation is increasing due to US government initiatives. For instance, the 2005 US Energy Policy Act calls for a study of the growing energy requirements of China and its implications for US security interests, which should include: 'a comparison of 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 that other nation, including the laws and regulations of the People's Republic of China'.[128]

China and India have been accused of 'changing the international oil and natural gas game' through long-term comprehensive deals by wholly or partly state-owned companies to secure a priority to oil and natural gas against benefits such as financing,

[126] 'Cynicism greets Sino-Indian deal to end rivalry over oil supplies', *Financial Times,* 15 January 2005.'
[127] 'Sudan: China and India fill void left by rights campaigners', *Financial Times*, by Carola Hoyos, 28 February 2006. For the same argument, see Daniel Yergin 2006. "Ensuring Energy Security." *Foreign Affairs* 85/2, March/April: 69-82 (77): 'Indeed, from the viewpoint of consumers in North America, Europe, and Japan, Chinese and Indian investment in the development of new energy supplies around the world is not a threat but something to be desired, because it means there will be more energy available for everyone in the years ahead as India's and China's demand grows.'
[128] US Energy Policy Act of 2005, Sec. 1837, National Security Review of International Energy Requirements, p. 548.

industrial deals, arms deals, etc.[129] The effect on the international oil and gas markets is said by the critics of these practices to limit volumes available in open markets. However much the oil is 'taken off the market', it does boost supply more generally and thus reduces somewhat the market pressure from increasing Chinese and Indian demand. Moreover, India and China are facing limitations in their current energy cooperation with one significant oil producing country, namely Iran, because of US pressure to isolate Iran, politically and economically. US sanctions policies against Burma have similarly represented a challenge to Chinese and Indian cooperation with the Burmese military regime, although this does not appear to have stopped their companies from investing in Burma, and has even provided advantages to both India and China as western companies have pulled their investments out. The case of Iraq before the US invasion represents another prominent example of a sanctions regime (managed through the UN Oil for Food program) that has in effect served as a limitation on the free supply of oil to the market.

6.4 Relations with the Middle East

As BP chief executive John Browne recently stated, 'unless geologists succeed in finding new and so far unidentified provinces, as consumers we will all be dependent on supplies from just three areas – west Africa, Russia and, most important of all, the five states around the Mideast Gulf, led by Iran, Iraq and Saudi Arabia.'[130] This 'common knowledge' among energy specialists in Western countries is equally obvious to Chinese and Indian analysts. According to a projection by Indian energy analyst Chudamani Ratnam, former Chairman of Oil India Ltd., as early as 2020 the only exploitable oil reserves left will be in Africa and the Middle East.[131] Such projections should not be taken too seriously since they build on the assumption that the Middle East will continue to supply so much oil that the oil price is kept too low to allow investments in alternative energy or in producing oil from tar sands and coal, etc. Ratnam has a point, however, since the mere prospect of a stabilized Middle East regaining its ability to provide abundant amounts of cheap oil to the world market may seriously hamper investment in alternative sources of energy. Chinese and Indian

[129] Noreng, Øystein, 2006, *Crude Power: Politics and the Oil Market*. London: I.B.Tauris Publishers, p. xxviii.
[130] Cited in 'A serious problem', *Petroleum Economist*, March 2006.

fears are also fuelled by suspicions of US intentions. Says Ratnam: 'while so far the USA has been willing to share the available worldwide oil and gas production, there is now a feeling that they may not be willing to do so in the future and will treat Middle East reserves as a captive asset'.[132] This threat perception, which may not be warranted under present conditions but could quickly become more realistic in a global crisis situation, provides one part of the backdrop to current energy security debates, both in India and notably in China.

[131] Chudamani Ratnam 2005, "The future of petroleum: An Indian perspective", paper presented at the 7th Asian Security Conference, New Delhi, January.
[132] Ibid.

7. Future scenarios

Based on the above description of how India and China try to cope with energy security using multiple parallel strategies, this section briefly outlines three energy security scenarios that would impact greatly on Asian and international relations.

7.1 Increased cooperation

The situation around the Persian Gulf stabilizes, an increasing number of oil fields come on stream, new more efficient technology is introduced, and the Gulf countries reassure the world concerning their ability to supply increasing quantities of oil. OPEC regains its capacity to stabilize the oil price at a relatively high level, so it becomes possible to make substantial investments in exploring for oil also elsewhere, to extract oil from tar sand, and develop new technologies. Increased energy cooperation and new energy technology allow China and India to increase their energy efficiency and reduce the growth in demand for oil. All of this strengthens the two countries' economies and contributes to long-term regional stability. Factors that tend to lessen political tension include the further promotion of economic cooperation between the largest oil importers (the USA, Japan, China and India). China and India become members of IEA and are ready to use their strategic oil reserves whenever OPEC should be unable to prevent a price spike. Over time, both countries develop a power sector based mainly on renewable sources of energy, nuclear and clean coal-fired generators, and greatly enhance their use of natural gas, also as a transportation fuel. China and India also utilize new technology to extract methane and hydrogen from coal, and via fuel cells to use methane and hydrogen in transportation as well as power generation. In sum, these measures slow the overall global growth in oil consumption, while oil represents a steadily decreasing role in the global energy supply. China also greatly improves the efficiency of extraction of its domestic oil fields, and successfully delimitates national zones of jurisdiction in the East and South China seas, so it can cooperate successfully with Japan, Taiwan and Vietnam on offshore oil and gas extraction. China and India both develop an international or global concept of energy security.

7.2 Conflict in East Asia

China's relations with Japan worsen further, and incidents occur between the Chinese and Japanese navies in the contested parts of the East China Sea. China steps up its political pressure against Taiwan to cede to its 'One China' policy. Due primarily to US fear of an increasingly chauvinistic and anti-Western China, and to calculations in Washington that it is better to confront China now than later, when it may have become too strong, the USA and Japan intervene on the side of Taiwan, cut off ties with the PRC and impose an oil embargo. Vessels on their way to China are seized in open sea, and the combined forces of the Japanese, US and Australian navies are too strong to allow the Chinese navy to react forcefully. An acute economic crisis ensues in China's coastal areas, leading to tumultuous political events, and also to serious economic problems in other parts of the world, who have become dependent on the provision of Chinese products. Taiwan declares itself independent de jure and is recognized by Japan and the USA. The Chinese government now faces the difficult choice of either bowing to US demands and accepting a subservient status in the world system, or to resist with all the destruction this will entail.

7.3 The Middle East explodes

After a US bombing campaign against Iran, targeting primarily Iran's nuclear sites, Iran reacts with all the means at its disposal, seeking to disrupt traffic through the Hormuz strait, attacking Israel with missiles, sponsoring attacks against the US forces in Iraq, and massing troops along the Iraqi border in Khuzestan. This leads to a full scale war, with Kurdistan breaking off its ties with Baghdad, and a great number of terrorist attacks in Lebanon, Syria, as well as in Western countries. While the US Navy and Air Force are preoccupied with the war in the Middle East, and seek to keep tanker traffic open through the Hormuz strait, the oil price soars to unprecedented heights. In this situation the US has been forced to reduce its military presence in the Asia Pacific. Through a grand Chinese-Japanese bargain the two countries join forces to secure the oil they need, partly by paying exorbitant prices, and partly by having their own oil companies provide cheap oil from countries where they have acquired ownership to producing oil fields. They also secure oil supplies from Russia and Kazakhstan, and from their own offshore production. Taiwan needs China's support to get the oil it needs, and bows to Beijing's pressure for accepting the 'one China'

principle. India fails to meet its energy demands and falls into a severe economic and humanitarian crisis. While the US and Persian Gulf countries are being exhausted by warfare, China steadily increases its global influence, and eventually establishes a dominant role in the reconstruction of West, Central and South Asia. Europe comes under strong Chinese influence, while America licks its wounds.[133]

The first scenario, 'Increased cooperation' is of course the most positive and hopefully also the most likely. The second scenario, 'Conflict in East Asia' is probably the least likely. This is not because a Sino-Japanese embargo would be difficult to undertake, but because China has invested so heavily in the US market that it could use its withdrawal from that market as a very effective countermeasure to weaken the US economy. In addition, the Chinese public would patriotically support the Communist party-state if a joint US-Japanese embargo were to be imposed. The third scenario, 'The Middle East explodes' represents the nightmare scenario of a full-scale resource war with global impact and serious consequences. The beginnings of this scenario would be a US invasion of Iran, which would be followed by a protracted period of violent small-scale resistance and internal disturbance, as we have seen in Iraq. This would further destabilize the entire greater Middle East, and might well spread into Saudi Arabia and Syria.

As for the timing of the three scenarios, the first takes a long-term perspective of 25-30 years, due to the technological advances that are taken as conditions. The second scenario is short- or medium-term, with a perspective of 5-10 years, depending on how economic relations between China and the United States are managed. The timeline of the third scenario is more difficult to predict. All three scenarios depend to a greater or lesser extent on the availability of crude and refined oil in the world market over the coming years. The sooner the global peak in oil production occurs and supplies become scarcer, the higher the risk of a full-scale conflict in the Middle East, because alternative fuel systems will be less developed and oil dependency will be more serious when oil shortages set in.

[133] According to an article by David Ignatius in *Washington Post*, 12 April 2006, Zbigniew Brzezinski, the once hawkish national security adviser to President Jimmy Carter, had told him recently that he was thinking of war with Iran as 'the ending of America's present role in the world … In a war with Iran,

8. Policy recommendations

This final section of the report offers suggestions for issues that Norway may concentrate on in its relations with China and India. The main policy objective should be to enhance their energy security by seeking ways of establishing a better balance in the global relationship between supply and demand. This means to help them be more energy efficient, diversify their sources of energy, use more natural gas, develop cleaner ways of utilizing coal, and enter into more international cooperation. We also recommend that Norway seek Chinese and Indian support for launching a major multinational initiative for developing the technologies needed in a world with no access to cheap oil. In this connection we also suggest to launch research projects or programmes that may help build a lasting Norwegian research competence on energy security in Asia.

8.1 Promoting energy efficiency

Both China and India have an enormous potential for improving their energy efficiency, and this presents a promising area for technological cooperation with Norway. Some analysts have suggested that steps should also be taken to slow the rise in energy consumption in China and India, especially the growth of electricity demand,[134] This is ethically and politically difficult since per capita energy consumption is in fact much higher in the mature market economies of North America, Europe and Japan than in India and China.[135] However, in recent years the growing concern for energy security, and rising oil prices, has led to a much increased awareness of the importance of energy efficiency among both Indians and Chinese. Improving energy efficiency is hence regarded as a key measure for enhancing energy security, and development cooperation in this field would no doubt be highly appreciated.

8.2 Clean coal and natural gas

Norway has already contributed to the promotion of cleaner energy in China, but more such support should be considered. In India as well as China coal will continue

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we'll get dragged down for 20 or 30 years. The world will condemn us. We will lose our position in the world.'

[134] See for instance Mikkal E. Herberg 2005, "Asia's energy insecurity, China and India: Implications fro the US", Testimony to the United States Senate Committee on Foreign Relations, July 26.

to be a major source of energy, and gas-fired power generation is set to increase. Support for the development of clean coal and gas technology for electricity production would be beneficial from an environmental perspective, but also as a measure to enhance energy security. China has also expressed a strong interest in coal liquefaction technology, and would like to see liquid fuels based on coal substitute for some of its petroleum demand for transportation. A coal liquefaction facility is under construction by the Shenhua Group in Inner Mongolia. Despite the high costs, Chinese officials have shown increasing interest in further research into improving coal liquefaction technologies, in the hope that it may eventually provide an economically viable domestic source of liquid fuels. Natural gas is particularly important in this regard, as it can to a greater extent serve as a substitute for oil. However, to develop a sizeable gas market in China and India will require strong energy policy actions. In the case of China it will be necessary to reform gas pricing and taxation policies, and establish a set of indispensable elements for the development of a modern gas industry, including technical norms, standards for health, safety and environment, training of technical and commercial gas professionals and gas technology research and development ability.[136] During a visit to China in February 2006, EU Energy Commissioner Andris Piebalgs signed a Memorandum of Understanding with the Chinese government on near-zero emissions power generation technology.[137] The EU's intention is to work with China on building clean coal power plants. Norway should look seriously into supporting these Sino-European efforts or carry out related projects in China. India is facing three major challenges on its way to becoming a sophisticated gas economy: lack of sufficient transmission infrastructure, lack of a coherent legal and regulatory framework, and questions about the affordability of gas.[138] In both countries, funding must be mobilised, and foreign investment is needed. Norwegian investment in gas infrastructure, clean coal and gas technological support and assistance in energy sector reform would be of benefit to both China and India in their efforts to develop their coal and natural gas sectors.

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[135] See table above for a comparison.
[136] Findings of recent IEA work, available online at www.iea.org/textbase/nppdf/free/2005/findings.pdf
[137] http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/190&format=HTML&aged=0&language=EN&guiLanguage=en (accessed 19 Apr 2006).
[138] Ibid.

8.3 Invite India and China to the IEA

A strengthened international energy security co-operation would benefit China and India as well as the OECD and IEA member countries. Both China and India are currently excluded from the global emergency oil sharing system managed by the IEA, and their exclusion from vital international energy management institutions aggravates their zero-sum view of global energy trade and politics.[139] China is building its own strategic oil reserves, and India intends to do so. Despite promising recent developments in bilateral cooperation between India and China the two countries still compete for energy supplies in third countries that are potential sites of future unrest, notably Burma. A stronger regional energy cooperation including regional emergency oil sharing mechanisms in particular would reduce the potential for conflict. It is also important that Chinese and Indian SPRs be coordinated with IEA and western reserves to maximize their effectiveness during any supply crisis.[140] As experts such as Mikkal Herberg point out, APEC is not an effective forum for this, since it is too large and heterogeneous and India is not a member. Nor is the ASEAN Regional Forum (ARF) likely to be effective. An obvious solution to this problem would be to have China and India accepted as additional members of IEA. Norway could make an important contribution in this regard by nominating and promoting the candidature of India and China in the IEA.

8.4 Further research on energy security

Chinese and Indian policymakers regard nuclear power generation as a source of clean electricity generation, as well as a means of reducing fossil fuel dependency. The growing importance of nuclear energy in the energy planning of both India and China warrants more attention to the risks of nuclear proliferation as well as reactor safety and waste transportation and storage risks.

Technological research as such will be undertaken with support from the Research Council of Norway under the programs PETROMAKS and RENERGI. This research may benefit future cooperation with China and India on the promotion of energy

[139] Mikkal E. Herberg 2005, "Asia's energy insecurity, China and India: Implications fro the US", Testimony to the United States Senate Committee on Foreign Relations, July 26.

efficiency and the further development of clean coal and natural gas, but only if Norwegian researchers take Chinese and Indian realities into consideration. It is important to combine knowledge from the natural and social sciences in researching even a highly 'technical' issue such as energy efficiency for application in an Indian or Chinese setting. This is why we suggest that the Research Council aim to establish research projects focussing on India and China, with participation both by natural and social scientists.

Finally the geopolitics of energy security is set to become increasingly important for international relations and foreign policy formulation. Relevant research topics within this field include Chinese and Indian responses to US policies in the Persian Gulf, the politics and implementation of sanctions regimes, and issues of transparency and business ethics in the extractive industries versus national security interests. Economists have never been able to predict the future of the oil price, partly because so many political factors are involved. For this and several other reasons economists and other social scientists must collaborate in developing research on energy economics and energy politics. This need is all too evident at a time when a new crisis in the Middle East threatens to evolve either into a system of UN-imposed sanctions against Iran, the country with the world's third largest oil reserves, or to US warfare against Iran. Such political events could have devastating consequences for global energy security, as well as for the world economy.

[140] Ibid.

A Case Study of Burma

1. Introduction

Burma[141] exemplifies the difficult balance of competition and cooperation between China and India over oil and gas resources in third countries. Both India and China regard Burma as a potential source of natural gas. Their proximity to Burma provides an opportunity to diversify fuel supply to West Bengal and Yunnan, which will then be less dependent on provision of LNG. While India hopes to get gas from Burma's Shwe gas field by pipeline through Bangladeshi territory, China hopes to tap the same source through a pipeline across the highlands on the Sino-Burmese border (known during World War II as 'the Hump') to Kunming, the capital of Yunnan. PetroChina signed a Memorandum of Understanding in late 2005 with Burma on sale of gas from the Shwe field to China, via such a pipeline. In case this becomes a reality, it will come in addition to an oil pipeline, which China and Burma have agreed upon earlier, from the port city of Sittwe to Kunming. This pipeline was reportedly approved by Chinese authorities in early April 2006, with construction expected to begin already this year.

All of this is well in line with a long-established Chinese strategy to obtain access to the Indian Ocean through Burma, and thus reduce China's dependence on transport through the Malacca Strait and the South China Sea. Port development in Burma has long been a key objective for China.

From India's perspective the Chinese pipeline plans are annoying. For more than two years India has presumed that gas from the Burmese Shwe field's A-1 Block would be provided exclusively to Kolkata via a proposed overland pipeline through Bangladesh. This plan, which had been agreed between India and Burma, ran into serious problems, however, when Bangladesh demanded a number of concessions from India in return for allowing the overland route, and India refused to accept these concessions.

[141] In line with the practice of all supporter's of Burmese democracy, the name 'Burma' is used consistently in this report, although the official English-language name of the country under its present regime is 'Myanmar'.

The introduction of China to the Shwe gas picture was unexpected, but should not have been surprising. Burma already gains substantial hard currency from the sale of natural gas through pipeline to Thailand, and is of course aware of the advantages it can reap from negotiating prices when selling gas from the same field to more than one country at a time. Burma would have been foolish if it accepted to set aside the gas exclusively for India at a time when that country's bilateral negotiations with Bangladesh had stalled, when PetroChina offered another way out. The MoU with PetroChina reflects the ever growing economic and trade relationship between Burma and China.

As a result of increased Chinese influence in Burma, and also the arms trafficking going on across the Indo-Burmese border, India has sought to strengthen its ties with Burma and has never been willing to consider joining Western sanctions. In 2004 an agreement was signed in Yangon by the foreign ministers of India, Burma and Thailand to develop transport linkages between the three countries, including a 1,400 km highway connecting North-eastern India with Mandalay and Yangon, and on to Bangkok. A planned deep-sea port in Dawei, together with a new highway connecting it to Kanchanaburi in Thailand, would no doubt contribute further to commercial links. Building Dawei port also has a direct security angle for the Indian navy, which is now in the process of sorting out the technical and financial details of its ambitious Far Eastern Naval Command (FENC) project at Port Blair, the capital of the Andaman Islands.

The main contention between India and China in Burma relates to their energy security concerns. As discussed in our main report on Asian energy security, India and China intend to cooperate in the field of energy security and avoid costly rivalries. Several commentators have said it will be more or less impossible for the two oil importing giants to avoid such rivalries. In Burma it seems difficult indeed. The main issue is the one referred to above, namely the rivalry over newly discovered offshore natural gas resources. An underlying issue is Chinese naval presence and intelligence monitoring in the Bay of Bengal and the Andaman Sea, areas where the Indian navy has been used to operate undisturbed, and in the Strait of Malacca. The Sino-Indian naval rivalry will no doubt give rise to further competition over assistance to Burma

in building deep-sea ports and maritime facilities, and connecting infrastructure such as roads and air strips. A third complicating factor in the relationship is Burma's new nuclear research reactor. It is possible that China's decision to avoid involvement in this project, and leave it to Russia, is a part of its effort to reassure India.

On the more general level, there is also of course the illegitimate and oppressive nature of the Burmese military regime. There has been very little progress in the direction of reintroducing democracy in Burma, or even in preparing the ground for a government with more civilian influence. Burma recently moved its official capital from the commercial and cultural metropolis Yangon to a more protected newly constructed internal capital at Pyinmana. Yangon was probably seen as too exposed from the security perspective of the regime. While the political nature of the Burmese regime has been a key concern in the European and American approach to Burma, and also represented a problem for Burma's fellow member states in the Association of Southeast Asian Nations (ASEAN) as well as Japan, India and China have sought to downplay, or even overlook this problem, in order not to undermine their national interest in keeping up close relations with the Burmese power holders.

China is set to maintain a strong strategic interest in Burma, both in order to prevent other powers from influencing an area so close to China's volatile Yunnan province, to monitor sea traffic in the Bay of Bengal and the Andaman Sea, and to maintain a naval presence in the area north of the Strait of Malacca. It is well documented that China fears an oil embargo in a time of crisis. Access to ports on the other side of the Strait of Malacca may be seen as an asset in this connection.

We conclude the report below by asserting that Burma is likely to remain under strong Chinese influence for the foreseeable future and that the most promising prospect for positive political developments in Burma may depend on such positive developments within China itself. A stable and prosperous China might be able to engage constructively with the Burmese regime. This may provide the best chance of resolving the current crisis in Burma. In essence, China holds the key to the Burmese future. Countries in the neighbouring region, especially India and Thailand, but also Australia and Japan, may have important roles to play, but China is the main external

actor in Burma today. We therefore recommend to seriously consider the possibility of engaging China in any effort to improve the situation in Burma, whether through targeted sanctions, constructive engagement and/or any form of dialogue. This could also involve talks concerning the energy sector.

The case study starts with a historical overview of the oil and gas business in Burma, then analyses briefly the political context before it proceeds to present the main actors and interests involved in the oil and gas business. Then it goes more deeply into the Sino-Indian geopolitical interests in Burma, so visible from their competition for Burmese natural gas (a competition in several ways resembling the one between Japan and China for Siberian oil, described in the main report). We end the report by outlining some possible policy implications for Norway.

2. A history of oil and gas exploitation

Burma is one of the poorest countries in Asia. It is also among the world's oldest oil producing countries. Oil was extracted manually at Yenangyaung on the Irrawaddy River since ancient times, and the first exports of crude oil were shipped to Britain as early as 1853.[142] The first foreign oil company to operate in Burma was the Rangoon Oil Company, set up in 1871 by a group of Scottish entrepreneurs. Oil, timber and gems were the natural resources that drew the British colonizers to Burma, annexed as a province of British India in 1886. The extraction of oil was since monopolized by the British through the Burmah Oil Company, which was set up in continuation of the Rangoon Oil Company in 1886, and dominated the Burmese oil industry until 1962. Immediately after the annexation, the Burmah Oil Company took over the Yenangyaung oil field from its indigenous owners. In 1897 another major oil field was discovered by drilling at Singu in the Irrawaddy basin; the Chauk-Lanywa field. By 1906 Burmah Oil delivered nearly half of all kerosene supplies to India, and was the contracted provider of fuel oil to the British Navy. Oil refineries were built at Syriam, a port on the Yangon River opposite Yangon (Rangoon). Later crude oil from Chauk was sent by a 563 km pipeline to Syriam for refining. A profitable oil industry was established, with production reaching 6.56 million barrels in 1939 and oil exports amounting to US$35 million in 1940.[143]

Oil production declined from 1942, when Japan occupied the country and destroyed the Syriam refinery. Insurgent sabotage of the pipeline during the independence struggle after World War II confined marketing of Chauk's oil to northern Burma. Oil tankers began operation on the Irrawaddy River as an alternative means of transport to the damaged pipeline. A refinery at Chauk was renovated in 1954, and the pipeline was repaired between Chauk, Tagaing, and Yenenma and between Prome and Syriam. The Syriam refinery was restored in 1957 and underwent expansion in 1979 with Japanese assistance. A pipeline connecting the Mann oilfield and Syriam was also

[142] For an exceptionally detailed account of the history of Burmese oil extraction until 1914, see Marilyn V. Longmuir 2001, *Oil in Burma. The Extraction of 'Earth-Oil' to 1914*, Bangkok: White Lotus Press.
[143] David I. Steinberg 2001, *Burma. The state of Myanmar*, Washington D.C.: Georgetown University Press: 22, 134.

completed in 1979, and the Syriam refinery now has a tanker terminal, while Mann has its own refinery.[144]

Burma's independence from Great Britain in 1948, after 62 years of colonization was followed by recurrent political unrest, armed insurrections and civil strife, particularly among the Mon, Rohingya, and Karen minorities. The Chinese civil war also spilled over into northern Burma. According to some estimates, the death toll may have reached 60,000 people in the first two years after independence.[145] During the first years of civil war oil production was badly hit. The oil fields at Yenangyaung, which were for a long time the most productive fields in Burma, were seized by rebels (Communist Party of Burma and People's Volunteer Organisation) and recaptured by government troops as late as 1953.[146] The Burmese government always regarded the country's oil and gas reserves as an important economic asset, and even the opposition used promises of oil concessions to fund their activities. According to Smith (1999) the prominent opposition leader U Nu, who served as prime minister in 1948-58 and 1960-62, received US$1 million after reportedly making a deal with the Canadian Asmara Oil Company in the late 1960s.[147]

After 1962, when Socialist military rule was established under Ne Win, the oil industry was nationalised. The Myanma Oil and Gas Enterprise (MOGE) was set up in 1963, under the Ministry of Energy. The ministry later established the Myanma Petrochemical Enterprise, which operated refineries and processing plants, and the Myanma Petroleum Products Enterprise, which handled the distribution of petroleum products. In the early 1980s the first offshore joint venture was set up with a Japanese investment company to explore and develop offshore gas in the Gulf of Martaban. In 1985 another agreement was signed with Petro-Canada International Assistance Corporation to do a feasibility study for offshore gas development in the Gulf.

When Ne Win finally stepped down in the summer of 1988, what became known as the Burmese democracy movement organized numerous mass rallies, and strikes were

[144] Encyclopædia Britannica online, Syriam, Chauk.
[145] Martin Smith 1999, *Burma. Insurgency and the politics of ethnicity*, London: Zed Books: 119.
[146] Ibid.: 120.
[147] Ibid. p. 277. Some sources claim that the CIA was behind the deal.

staged all over the country. The Syriam oil refinery was brought to a standstill.[148] The movement was defeated after a military coup and the imposition of martial law by the State Law and Order Restoration Council (SLORC).[149] A year later, in 1989, the Syriam refinery was targeted by a bomb attack, leading to the arrest and execution of three suspects after summary trials.

Until the 1990s oil was a key export product for Burma. During the 1960s and 1970s oil production remained modest, but increased from 3.81 million barrels in 1965 to 6.3 million barrels in 1971 to 9.55 million barrels in 1978.[150] In the early 1980s the production declined, due to technical limitations and government reluctance to accept intervention by foreign operators. Before SLORC took power in September 1988, all Burmese governments had prohibited foreign participation in onshore oil exploration and production. In 1988, however, SLORC opened up the opportunity for foreign companies to explore for oil and gas. After the promulgation of the Foreign Investment Law in November 1988,[151] MOGE entered into production sharing contracts (PSCs) with several multinational oil companies on petroleum exploration and production in both onshore and offshore areas. Ten companies, from the USA, Britain, France, the Netherlands, Japan, Australia and Korea, received concessions.[152] Substantial payments were made to SLORC on the execution of contracts. However, the results of onshore oil exploration were disappointing, and by 1997 only five companies remained active in the country. Throughout this period oil production was in decline. In the fiscal year 1989/90 annual production was as low as 5.5 million barrels, in 1994/95 the figure was 4.28 million barrels, and in 1996/97 only 3.8 million barrels.[153]

[148] Ibid., p. 8.
[149] The State Law and Order Restoration Council (SLORC) was renamed the State Peace and Development Council (SPDC) in November 1997, when its first chairman Gen. Saw Maung died and was succeeded by Gen. Than Shwe.
[150] David I. Steinberg 2001, *Burma. The state of Myanmar*, Washington D.C.: Georgetown University Press: 133-134.
[151] The Myanmar Foreign Investment Law is available at the official government website, at http://www.energy.gov.mm/Incentive_1.htm.
[152] A total of 46 onshore blocks and 25 offshore blocks had been apportioned as of 2000.
[153] David I. Steinberg 2001, *Burma. The state of Myanmar*, Washington D.C.: Georgetown University Press: 22-23, 148.

Natural gas production started in 1974 at the Aphyauk gas field near Taikkyi Township in the lower delta of the Irrawaddy River. Natural gas produced from the wells at this field was piped to Yangon for power generation at Thaketa and at Shwedaung near Prome, and for industrial use at the Sittaung paper mill in Yangon. In 1975 gas production reached 4,575 million cubic feet, rising to some 40,000 million cubic feet in 1990, dropping to 31,782 million cubic feet in 1991/92, and rising again to 58,575 million cubic feet in 1996/97.[154] In 1993 SLORC invited foreign bids for offshore exploration in 18 concession blocks, 13 in the Gulf of Martaban and five off the coast of Arakan state. Oil companies such as Texaco, Premier Oil, Total and Unocal were among the successful bidders. Two major offshore gas fields, Yadana and Yetagun, were discovered in the Gulf of Martaban. The Yadana field has estimated gas reserves of more than 5.3 trillion cubic feet, or 150 billion cubic meters, with an expected field life of 30 years. The Yetagun field has estimated reserves of 48 billion cubic meters. Production from the Yadana field started in 1998, and production from Yetagun started in 2000. The discovery of a new gas field off the coast of Arakan was announced in 2004. The Shwe gas field, as it was named, comprises several blocks of gas of unconfirmed size, of which the A-1 and A-3 blocks are currently under development.

[154] Ibid.: 148.

3. The political context

The National League for Democracy (NLD) grew out of the 1988 democracy movement, and has since been led by Aung San Suu Kyi. Soon after SLORC rule was established, Suu Kyi was detained and put under house arrest. In 1990 general elections were held. NLD gained a clear majority of the votes, but SLORC refused to give up its dictatorial rule. Suu Kyi was held under house arrest until 1995.

Although SLORC invited foreign investment and a number of Western companies took up their offer, many have since withdrawn from Burma, for different reasons. Following long-standing protests against investment in Burma, the European Union introduced its first *Common Position* on sanctions against Burma in 1996, and US President Bill Clinton enforced a prohibition on future investments in Burma in 1997. This was on the advice of the Burmese democracy movement, including Burmese exile activist groups, Aung San Suu Kyi and the NLD. The EU *Common Position* has been gradually expanded, and currently bans investment in Burmese state-owned enterprises, precludes travel to the EU by officials of the State Peace and Development Council (SPDC) and their families, and freezes their bank accounts.

Multinational companies operating in Burma have also been under heavy pressure from NGOs, especially in Europe and the United States, who have carried out numerous public campaigns, including protests outside shareholder meetings and the publication of blacklists of companies with a presence in Burma.[155] The Yadana pipeline and Yetagun gas development projects have been particularly controversial. Since the 1990s NGOs have also provided legal assistance to Burmese nationals affected by the construction of the Yadana pipeline, and have taken their cases to court in the US and Europe. In 1996 EarthRights International filed a lawsuit in US courts on behalf of 15 Burmese villagers, against California-based Unocal for human rights abuses associated with the construction of the Yadana pipeline.[156] In 1997, the

[155] For NGO views on human rights abuses associated with gas projects in Burma, see the EarthRights International report 'Total Denial Continues' (2003) and the web article 'Another Yadana'; on foreign investment, see 'Destructive Engagement: A Decade of Foreign Investment in Burma' (1999), available at http://www.earthrights.org/files/Reports/destructive.pdf; on sanctions, see 'The European Union and Burma: The Case for Targeted Sanctions' (2004), available at www.burmacampaign.org.uk/reports/targeted_sanctions.htm.

[156] The 9th Circuit Court's decision ('Doe v Unocal') is available online at http://www.laborrights.org/projects/corporate/unocal/unocal091802.pdf,

US Federal District Court in Los Angeles found that, 'the evidence does suggest that Unocal knew that forced labor was being utilized and that the Joint Venturers benefited from the practice.' On the basis of this finding the Court concluded that corporations and their executive officers can be held legally responsible under the Alien Tort Claims Act for violating international human rights in foreign countries, and that US courts have the authority to adjudicate such claims.[157] In Europe lawsuits were filed against Total, first in Belgium on the basis of the Universal Jurisdiction Law citing 'complicity in crimes against humanity' and later in France, citing 'complicity in unlawful confinement'.[158]

Both the case in France against Total and in the USA against Unocal were settled out of court, and none of the companies ceased to operate in Burma. However, the mounting pressure led other oil companies to withdraw. In the mid-1990s Texaco and Premier Oil were joint partners in the Yetagun project, but in 1997 Texaco withdrew from the venture and Premier Oil increased its stake from 20% to 27%. In 2002 Premier Oil also had to pull out of the Yetagun project, after sharp criticism of its involvement and calls to withdraw from the British government as well as US investors. Premier's share in the Yetagun consortium was bought by the Malaysian oil company Petronas.

In 2000 Aung San Suu Kyi was again detained, but in May 2002 she was released from house arrest after UN-led confidence-building negotiations. Following this, Japan and Australia agreed to provide financial support for targeted development programs and dispatched their foreign ministers to Burma for the first time in almost two decades. Tokyo also began releasing part of a US$28 million aid package for a hydroelectric dam.[159] However, this situation did not last long. In May 2003 Suu Kyi was rearrested, together with a large number of NLD followers. The Association of Southeast Asian Nations (ASEAN), of which Burma became a member in 1997, broke its traditional principle of non-interference in the domestic affairs of its members, and called for the release of Suu Kyi and other political prisoners in Burma.

[157] EarthRights International, 'Shwe Gas Project in Burma: Recent Developments', 8 March 2006, online at http://www.earthrights.org/content/view/289/41/1/1/.
[158] Total 2005, 'Total in Myanmar. A sustained commitment', p. 33.
[159] Encyclopædia Britannica online, Myanmar, Year in Review 2003.

Japan, Burma's top donor, stopped all new humanitarian and development aid, and the EU extended and intensified sanctions for another year.[160] The United States authorized new sanctions under the Burma Freedom and Democracy Act of 2003, and the accompanying 'Presidential Executive Order', extending a visa blacklist to all of Burma's military leaders, freezing their overseas assets, and banning all imports from Burma.[161] United States financial institutions were also directed to take special measures against Burma to deny access to the US financial system through correspondent accounts.[162]

In August 2003, General Than Shwe resigned as prime minister while continuing as chairman of the SPDC, and General Khin Nyunt, former chief of military intelligence, became the new prime minister. In October 2004 there were new fissures within the SPDC. After just over a year in office, Khin Nyunt was arrested on corruption charges (receiving a 44-year suspended sentence in 2005), and replaced by Lieutenant General Soe Win. Khin Nyunt had promoted UN-brokered talks between the government and the NLD, and was considered to represent a relatively outward-oriented and conciliatory faction in the regime. However, the talks reached a stalemate when the government excluded the political parties from the constitutional drafting process and kept Suu Kyi under detention.[163] In the autumn of 2003 the government introduced a 'Road Map to Democracy', which has likewise failed to meet expectations. When the National Convention finally assumed constitutional talks in February–March 2005, a number of ethnic and political groups, including the NLD, were left out. In an unexpected turn of events, the regime also announced its decision to move the capital to Pyinmana. Moreover, the SPDC refused entry to both the UN special envoy for political reform and the UN human rights envoy.[164]

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[160] Ibid., Year in Review 2004.
[161] The 'Burma Freedom and Democracy Act of 2003', online at: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=108_cong_bills&docid=f:h2330enr.txt.pdf
[162] Faced with a ban on remittances to Burma in US dollars, the Myanmar Foreign Trade Bank had to replace dollar accounts with accounts in euros. The Bank of China recently followed up with a decision to close the dollar accounts of Burmese merchants engaged in border trade, and replace them with euro accounts.
[163] The regime promised her release in December 2005, see 'Myanmar Agrees to Release Aung San Suu Kyi: Source', by Maila Ager, 13 December 2005, online at: http://www.commondreams.org/cgi-bin/print.cgi?file=/headlines05/1213-08.htm.
[164] Encyclopædia Britannica online, Myanmar, Year in Review 2005.

Although the withdrawal of Western oil companies operating in Burma has certainly had consequences for the projects in question, the impact of such withdrawals on the Burmese economy has probably been negligable, since countries such as Thailand, Russia, China and India continue to forge economic ties with Burma. The Burmese regime depends on revenues from foreign investment, primarily in oil and gas production. Access to Burma's gas resources is also high on the agenda of its neighbouring countries Thailand, Malaysia, India and China, as well as South Korea and Japan. In addition to gas, China and several ASEAN countries are looking to Burma as an important source of hydroelectric power. Hydropower development is set to become an important new income source for Burma, and another industry in which Burma has vital interests in common with its neighbors, particularly Thailand. In 2005 Burma signed an agreement with Thailand to build four new dams on the Salween River and one on the Tenasserim River, to produce hydropower for export to Thailand. At the same time the SPDC also signed contracts with two Chinese companies, CITIC Technology Co Ltd and Sinohydro Corp Ltd, to build a new hydroelectric facility, the 790-megawatt Yeywa hydropower plant on the Dukhtawaddy River near Mandalay.[165]

Japan provided funds for Burma's first large-scale hydroelectric project, the Lawpita hydropower plant and Mobye dam on the Balu Chaung River, built in the 1960s as a part of its war reparations package after World War II. According to the Karenni movement, the construction led to the displacement of more than 12,000 local villagers (mainly Shan and Karenni), due to forced relocation and land loss.[166] A Japanese company, Nippon Koei, was also involved in the initial planning, starting in 1981, of the Tasang Dam on the Salween River. At 228 meters, the Tasang Dam is slated to become the highest dam in Southeast Asia. The Chinese enterprise Sino Hydro Corporation Ltd. is one of the interested parties in a large-scale hydropower project now being developed by the Electricity Generating Authority of Thailand (EGAT), including the Tasang Dam and four other dams in Burma. The Asian Development Bank is currently promoting a US$4.6 billion regional electricity

[165] 'Burma junta to buy hydropower equipment from China', Democratic Voice of Burma, 17 July 2005.
[166] 'Dammed by Burma's Generals. The Karenni Experience with Hydropower Deevlopment From Lawpita to the Salween', 2006, Report by the Karenni Development Research Group, online at: http://www.salweenwatch.org/downloads/Dammed.pdf.

scheme which is to be powered in part by the Tasang Dam. The scheme is an initiative under the Asian Development Bank (ADB)'s Greater Mekong Subregion program, intended to encourage cooperation and economic growth in the six countries sharing the Mekong River basin. The program is based in part on recommendations from Norconsult, presented in a 1994 report to ADB on 'Promoting Sub-regional Cooperation among Cambodia, Laos PDR, Thailand, Vietnam and Yunnan Province of the People's Republic of China', funded by the Japan Special Fund.[167] According to current plans twelve hydropower projects in China, Burma and Laos will fuel the 'Mekong Power Grid' and generate power for consumers in Thailand and Vietnam; including the Tasang in Burma, the Jinghong and Nuozhadu projects in China, and the Nam Theun 2 in Laos.

In addition to the need for foreign revenue from hydropower and gas development, Burma's foreign relations are driven by the SPDC's vital requirements for military assistance. Since the early 1990s China has been the major provider of weapons, military aircraft, naval ships and other military hardware to the Burmese military. China withdrew, however, from a project to develop a Burmese nuclear research reactor. Burma then instead got support for this project from Russia and was able to start building the research reactor on an island off the Burmese coast. Russia has also become an important arms provider. In 2002 Russia signed an agreement to assist Burma in the building of a nuclear reactor. This project was presumably on the agenda of a Burmese 'goodwill' delegation to Moscow in April 2006, reportedly seeking Russian investment in hydropower and communications projects.[168] The Russian Foreign Ministry announced that the two sides discussed the importance of a regular dialogue on international and regional problems and interest in cultivating cooperation in fighting terrorism and drug-trafficking. In exchange for access to Burmese oil and gas resources, Russia also agreed to supply a range of arms including Tor-M1 and Buk-M1-2 air defense systems and MiG-29 fighters to Burma[169] (Russia's only really profitable investments abroad are in the Vietnamese oil sector, and Russia also sells a substantial amount of weapons to Vietnam.) Russia further offered to build factories

[167] 'Damming at Gunpoint. Burma Army Atrocities Pave the Way for Salween Dams in Karen State', Karen Rivers Watch, November 2004.
[168] BBC News online, **'**Burma's deputy leader in Russia', 3 April 2006, at: http://news.bbc.co.uk/2/hi/asia-pacific/4872158.stm

in Burma for reparing and upgrading arms bought from the former Soviet Union. According to some analysts, this was done 'in a bid to end Chinese monopoly'.[170] However, an alternative interpretation is that these factories would accommodate Chinese as well as Russian interests, since the hardware in question is also used by the Chinese military. In support of this view, Russian assistance to Burma was described by one commentator as 'a contribution to regional security following President Vladimir Putin's recent visit to China'.[171]

From the SPDC's perspective one of the key advantages of cooperating with Russia is to reduce the country's dependence on China. Another factor is that Russia has offered cooperation in establishing a nuclear power programme, something China may be reluctant to do. There is also reliable evidence that Pakistan has been assisting Burma in developing a nuclear programme. Two Pakistani scientists who were involved in Pakistan's nuclear arms programme have been working for Burma's for several years. Their presence in Burma was revealed when they appeared on a list of suspects of 'terrorist connections' presented to Pakistani authorities by the CIA in late 2001.[172] Burma recently granted the two scientists asylum.[173]

ASEAN, Australia and India are all seeking to 'constructively engage' the Burmese regime, and this, as well as China's close cooperation with the SPDC, is regarded by critics as undermining sanctions imposed by the US and EU. However, others take a more pragmatic view, considering among other the implications of the Western-imposed sanctions on Burma's economic and geopolitical ties as described above. Within the EU negotiations on the *Common Position* France, for instance, has objected to the current use of sanctions and called for more lenient sanctions or a replacement of sanctions with active engagement. In 2005, China and Russia also challenged US Burma policies, using the threat of a veto to block a US move in the

[169] 'Russia to supply wide range of arms to Myanmar', *Press Trust of India*, 4 April 2006.
[170] Bureau Report, 'Russia, Myanmar agree to step up ties', 4 April 2006.
[171] 'Myanmar seeks Russian arms for oil', AFP, 4 April 2006.
[172] 'CIA wants six more Pak nuke scientists probed**',** by K J M Varma, 6 December 2001. In January 2002, an article in the *Wall Street Journal* claimed that the two scientists were possibly aiding Burma's efforts to build a 10-megawatt nuclear 'research reactor'. The Pakistani government reportedly asked the two scientists to stay in Burma, fearing that they might leak information regarding the Pakistani nuclear program if they were interrogated.
[173] 'Pakistan Scientists Granted Asylum', *The Irrawaddy News*, 12 April 2006.

UN Security Council to implement recommendations on Burma. After the US and EU had threatened to boycott ASEAN meetings if Burma assumed the chair in 2006, Burma's rulers accepted to relinquish its turn to hold the rotating ASEAN chairmanship. During the most recent meeting of the ASEAN Regional Forum (ARF), however, Chinese Foreign Minister Li Zhaoxing chose to skip the security point on the agenda, and travel to Burma instead to express solidarity with the regime.[174] These are just a few examples of the continuous diplomatic maneuvering over Burma, with China, Thailand and other ASEAN countries, the United States, India, the EU, Australia and Russia playing some of the key roles.

[174] Encyclopædia Britannica online, Myanmar, Year in Review 2006.

4. Actors and interests in Burmese natural gas

In 2004 Burma exported natural gas (through the Yadana pipeline) to Thailand for nearly US$1 billion, which is claimed to be at least twice as much as Burma could have earned from trade with the US and the EU if they had not applied sanctions.[175] The oil and gas sector continued to grow in 2005, owing to Chinese, Thai, South Korean, and Indian investments. Thailand's imports from Burma, mainly consisting of gas from Yadana and Yetagun, rose by more than 50% that year.[176] Gas is now by far the most important source of income for Burma, and one third of Burma's foreign direct investments (FDI) are in the oil and gas sector. The combined FDI in Burmese oil and gas since 1988 is approximately US$2.5 billion, 33% of all of Burma's FDI.[177] From the newly discovered Shwe gas field alone, Daewoo International has predicted at least US$86 million in net profit annually for 20 years from 2010, while the Burmese regime is projected to earn at least US$800 million a year from the project, and could see up to US$3 billion a year.[178]

The Yadana project was developed by a consortium consisting of Total (31%), Unocal (28%), PTT-EP of Thailand (26%) and Burma's own MOGE (15%). It is is operated by Total. Gas from Yadana is transported via a 346 km subsea pipeline and a 63 km onshore pipeline from the Yadana field to the border between Burma and Thailand at Ban I Thong. At the border the Yadana pipeline connects with a pipeline built by Thailand, which carries the gas to its destination area near Bangkok, providing fuel to the Rathcaburi and Wang Noi power plants. Gas from the Yadana field covers an estimated 15-20% of Thailand's demand for natural gas.[179]

The Yetagun gas field was developed by a joint venture of Texaco (50%), the British oil company Premier Oil (30%) and Nippon Oil (20%). After Texaco's withdrawal in 1997 and Premier Oil's in 2002, Yetagun is operated by Petronas in a partnership with MOGE (20%), Nippon Oil (19%) and PTT-EP (19%). The gas is transported by 210

[175] Encyclopædia Britannica online, Myanmar, Year in Review 2005.
[176] Encyclopædia Britannica online, Myanmar, Year in Review 2006.
[177] 'Foreign Investment in Burma Hits US $7.6 Billion', *Irrawaddy* online newsletter, 18 November 2005.
[178] S. Mukherjee, 'Myanmar: Cheers Jeers over Giant Gas Find', *Asia Times* online, 13 February 2004, available online at http://www.atimes.com/atimes/South_Asia/FB14Df05.html.
[179] Total 2005, 'Total in Myanmar. A sustained commitment': 10.

km of subsea pipeline and 67 km of onshore pipeline, linking up onshore to the Yadana pipeline. The Yadana pipeline was constructed and is operated by the Moattama Gas Transportation Company, which has been set up by the shareholders in the Yadana gas field project.

In August 2000, the South Korean Daewoo International partnered with MOGE to explore and potentially develop offshore natural gas deposits in the Bay of Bengal off the coast of Arakan. Exploration commenced, and in 2004 Daewoo International announced the discovery of the Shwe gas field, off the coast of Sittwe, the capital of Arakan state. There are preliminary plans to explore for gas in several blocks in the Bay of Bengal, but so far test drilling has only been made in blocks A-1 and A-3. The A-1 gas block is the largest, estimated to contain 2.88 trillion to 3.56 trillion cubic feet of natural gas. The Shwe consortium and MOGE oversee development of the Shwe project, which will include drilling and transporting the gas to end-users. Partners in the project's international consortium are Daewoo (60%), the state-owned Korean Gas Corporation (10%), India's ONGC (20%) and the Indian GAIL (10%). Production from the Shwe gas field is planned to start in 2009.

Natural gas from the Shwe field has become a contentious issue in relations between India and China, and an obstacle to Sino-Indian energy cooperation. For over two years, it was presumed that gas from the Shwe field's A-1 Block would serve uniquely the Indian market via an overland pipeline through Bangladesh to Kolkata.[180] However, using India's growing demand for natural gas as a leverage point, Bangladesh set forth several conditions for any pipeline to cross Bangladeshi territory: Establishing trade routes for commodities from Bangladesh to Nepal and Bhutan through Indian territory; allowing transmission of hydro-electricity from Nepal and Bhutan to Bangladesh through Indian territory; and pursuing measures to reduce Bangladesh's trade imbalance with India.[181] The project reached a diplomatic stalemate when India refused these conditions. In December 2005, while India and Bangladesh deliberated to a standstill, Burma seized the opportunity to sign a

[180] On Shwe gas development prior to the MoU regarding the sale of Shwe gas to China, see Matthew Smith & Naing Htoo, 'Another Snake in the Jungle? Shwe Gas Development in Western Burma', *Watershed*, Vol. II, No.1, 31, 34-36 (July-Oct. 2005) online at http://www.terraper.org.

memorandum of understanding (MoU) with PetroChina for the sale of gas from the A-1 Block to China through an overland pipeline through Burma to Kunming in China's Yunnan province.[182]

Following publicity on the PetroChina agreement Burma assured the Indian petroleum ministry that it had sufficient gas reserves to meet the needs of both China and India, although India would have to wait until May 2006 for third party consultants to confirm reserves before export deals were finalised. Burma is waiting for assessments of several deposits, including the Mya1 well in the A-3 block. The Burmese promise seems to have satisfied the Indian government, since Brussels-based consulting firm Suz Tractebel was hired recently to conduct a feasibility study for overland pipeline routes to Northeast India, circumventing Bangladeshi territory. The findings and recommendations of Suz Tractebel are expected in May.[183] As of April 2006 Burma approved the sale of parts of Daewoo's stake in the A-3 block to ONGC, GAIL and Korean Gas Corporation (KOGAS). ONGC will purchase 20%, while GAIL and KOGAS will buy a 10% stake each from Daewoo.[184]

The introduction of China to the Shwe gas picture was unexpected but should not have been surprising. Burma has also been considering the possibility of building an LNG plant. According to the Burmese scholar Dr. Kyaw Yin Hlaing, the regime had no incentive to set aside the gas exclusively for India and patiently await the outcome of stalled bilateral negotiations with Bangladesh. It would be better to put some pressure on the Indians by developing an alternative. The MoU with PetroChina reflects the ever growing trade relationship between Burma and China. Finally, political instability in Burma contributes to a sense of urgency to all of the regime's recent undertakings, particularly when those undertakings secure needed revenue.[185]

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[181] 'Primary Jolt in Burma-India Gas Pipeline Project', *Mizzima* news, 19 January 2005, available online at http://mizzima.com/archives/news-in-2005/news-in-jan/19-January%2005-24.htm.
[182] David Fulbrook, 'Gas Deal Fuels China's Plans for Myanmar' *The Straits Times*, 2 February 2006, online at: http://www.orientreport.com/article_details.asp?gid=Politics&aid=Articles_Vmoe.
[183] Syed Ali Mujtaba, 'Consultant to Study Indo-Burma Gas Pipeline Routes', Mizzima News, 8 February 2006, online at: http://www.mizzima.com/mizzima/archives/news-in-2006/news-in-Feb/08-Feb-06-22.htm.
[184] Asia Pulse, 'Daewoo Int'l to sell development rights to Myanmar gas field', 3 April 2006.

[185] Kyaw Yin Hlaing, 2005, 'Myanmar in 2004: Why Military Rule Continues' in *Southeast Asian Affairs*, Institute of South East Asia Studies Publications, pp. 231-256.

5. Indian and Chinese geopolitical interests in Burma

Burma exemplifies the difficult balance between competition and cooperation between China and India over oil and gas resources in third countries. Both India and China regard Burma as a potential source of accessible natural gas supplies. Their proximity to Burma provides an opportunity for both countries to enhance their energy security by diversifying fuel supply sources while avoiding the need for expensive LNG transportation. For China, Burma also represents a possible overland supply route for oil and other commodities bypassing the Malacca Straits, although Yunnan province does not represent anywhere near the level of demand of China's coastal provinces. Enabling secure access to Burmese ports from the land side is a key objective for China. Another Chinese goal is to build an oil pipeline linking Burma's deep-water port of Sittwe with Kunming, capital city of China's southwestern Yunnan province. According to recent news, plans for this pipeline were approved by the National Development and Reform Commission (a department of the Chinese State Council) in early April 2006, with construction expected to begin this year.[186]

Assistance from the People's Republic of China to Burma dates back to the 1950s. A significant part of China's trade with developing countries has been financed through credits, grants, and other forms of assistance. During the early 1950s, Chinese aid went mainly to North Korea and North Vietnam, but from the mid-1950s until the late 1970s large amounts, mainly grants and long-term, interest-free loans, were promised also to non-Communist developing countries. The principal efforts were made in Asia, and Burma was one of the recipients, along with Indonesia, Pakistan, and Sri Lanka.[187]

In 1986 China withdrew its support for the long running insurgency of the Communist Party of Burma,[188] and began supplying the Burmese regime with arms. The influx of Chinese weapons was a great help to the Burmese military in its fight against ethnic

[186] 'Energy: Sino-Burma oil pipeline', *China Daily* online, 18 April 2006, at: http://www.chinadaily.com.cn/bizchina/2006-04/18/content_570622.htm. NDRC is macro-economic regulatory department, with a mandate to develop Chinese national economic strategies. Although not mentioned, this news indicates that Burmese authorities have already approved the pipeline.
[187] Encyclopædia Britannica online, China.
[188] The Communist Party of Burma was based in northeast Burma along the China border. In 1989 the CPB leadership was overthrown by its own troops, many of whom regrouped as the United Wa State Army.

insurgencies, many of which had relied indirectly on Chinese complicity. Chinese arms deliveries started in 1990, and over the next five years China had supplied $1.0-1.2 billion worth of weapons and other military equipment, including J-6 and J-7 fighters, A-5M ground attack aircraft, radar and radio equipment, surface to air missiles, tanks, armored personnel carriers, artillery anti-aircraft guns, multiple rocket-launcher systems, trucks, and naval ships, including frigates and fast attack craft (FAC).[189] Moreover technicians from the Chinese People's Liberation Army (PLA) vastly expanded the Meiktila air base south of Mandalay, and upgraded a smaller air base at Lashio, in the northeast, as a forward facility for aircraft refueling and resupply. Chinese assistance was also provided to upgrade the road and railway system from Yunnan to several ports along the Burmese coast of the Bay of Bengal. In 1992 China and Burma agreed that China would modernize Burmese naval facilities, in return for permitting the Chinese navy to use the Small and Great Coco Island (about 300 km south of the Burmese mainland, north of India's Andaman Islands). Since then Chinese experts have built an electronic intelligence station on Great Coco Island, vastly improved and militarized the Burmese port facilities in the Bay of Bengal at Akyab (Sittwe), Kyaukpyu and Mergui, and constructed a major naval base on Hainggyi Island near the Irrawaddy river delta. The Chinese base on Great Coco Island includes an air strip, signal intelligence nodes and an 85 meter jetty.[190] The base monitors Indian naval and missile launch facilities in the Andaman and Nicobar Islands, movements of the Indian Navy and other navies throughout the eastern Indian Ocean, as well the overall western approaches to the Strait of Malacca.[191]

China is currently building a deep-sea port in Kyaukpyu, in Rakhine state. Kyaukpyu has a water depth of 20 meters and is capable of accommodating 4,000 TEU (20-foot equivalent units) container vessels. Kyaukpyu is located on the route connecting southwestern China's Kunming city with Burma's Sittwe. According to the Burmese Ministry of Construction, the seaport and road construction, outlined as Kunming-

[189] 'Beijing's surge for the Strait of Malacca', by Yossef Bodansky, online at: http://www.freeman.org/m_online/bodansky/beijing.htm.
[190] South Asia Analysis Group, Paper no. 682, 7 May 2003, 'Hissing Dragon - Squirming Tiger: China's successful strategic encirclement of India', by Deepak V. Ganapathy.
[191] 'Beijing's surge for the Strait of Malacca', by Yossef Bodansky, online at: http://www.freeman.org/m_online/bodansky/beijing.htm.

Mandalay-Kyaukpyu-Sittwe, was under feasibility study in 2005. Once the 1,943 km Kunming-Kyuakpu road is completed, Burma will begin to draw economic benefit from the transit trade as well as job opportunities for Burmese workers and others in the region.[192] China's trade with Burma reached $1.2 billion in 2005, of a total Burma trade of $5 billion.[193]

One of China's strategic interests in Burma is to gain direct land access to the Southeast Asian nations and the Andaman Sea. Burma is not only a potential supply route bypassing the Malacca Strait, but can also offer a strategic staging point for controlling access to the Malacca Strait's western approaches. Yossef Bodansky (1995) claims that 'controlling' the Strait of Malacca is a key strategic objective of China, to the point of risking armed conflict with the regional states and even the US.[194] Bodansky maintains that the massive Chinese military buildup in Burma since the early 1990s reflects Burma's growing strategic significance, stressing that: 'the extent of the expansion of the transportation infrastructure, all in harsh jungle and mountainous terrain, exceeds by far the needs of even the most optimistic outlook for Sino-Burmese commercial relations'.[195] In the mid-1990s the Burmese regime permitted Chinese intelligence access to Zedetkyi Kyun Island, located off the coast of Burma's southernmost tip, Kawthaung or Victoria Point, which is close to the northern entrance to the Strait of Malacca. Bodansky claims that a military base there would enable China to threaten the approaches to the strait. China has currently set up listening posts in Sittwe and Zedetkyi Kyun, enabling China to monitor traffic in the Strait of Malacca and Phillips Channel.[196]

As a result of increased Chinese influence in Burma, as well as the safe haven and arms trafficking occurring along the Indo-Burmese border, India has sought in recent

[192] Ramtanu Maitra 2005, 'The energy ties that bind India, China', *South Asia*, 12 April 2005, available online at: http://www.atimes.com/atimes/South_Asia/GD12Df03.html.
[193] Testimony by Dr. Michael Jonathan Green, Center for Strategic and International Studies, before the US Senate Foreign Relations Committee, Subcommittee on Asia Pacific Affairs, 'The Strategic Implications of the Burma Problem'.
[194] 'Beijing's surge for the Strait of Malacca', by Yossef Bodansky, online at: http://www.freeman.org/m_online/bodansky/beijing.htm. Yossef Bodansky was the Director of the Task Force on Terrorism and Unconventional Warfare of the US Congress.
[195] Ibid.
[196] South Asia Analysis Group, Paper no. 682, 7 May 2003, 'Hissing Dragon - Squirming Tiger: China's successful strategic encirclement of India', by Deepak V. Ganapathy.

years to strengthen its ties with Burma.[197] India's interest in and involvement with Southeast Asia has been growing steadily over the past decade. In 2004 an agreement was signed in Yangon by the foreign ministers of India, Burma and Thailand to develop transport linkages between the three countries. This included a 1,400 km highway connecting Northeastern India with Mandalay and Yangon, and on to Bangkok, which would contribute to opening up trade between the countries, and give India access to Burmese ports. A planned deep sea port in Dawei, together with a new highway connecting it to Kanchanaburi in Thailand, would no doubt contribute further to commercial links. Dawei, the capital of Tanintharyi division, is on the long, narrow coastal plain of southern Burma.

Building Dawei port also has a direct security angle for the Indian navy, which is now in the process of sorting out the technical and financial details of its ambitious Far Eastern Naval Command (FENC) project at Port Blair, the capital of the Andaman Islands. FENC is intended to extend the Indian navy's nuclear/strategic combat capability. Dawei is located across the Andaman Sea on the Myanmar coast, almost facing FENC.[198] Indian analysts worry that the Chinese base on Great Coco Island poses a threat to the Indian tri-services command in Port Blair, which is only about 190 nautical miles (300 km) away. The Coco Island base lies only 22 nautical miles from Landfall Island, the northernmost of the Andamans. The Coco Island facility is also seen as a significant ELINT (Electronic Intelligence) and SIGINT (Signal Intelligence) threat to India's missile testing range, Chandipur-on-Sea and The Sriharikota Launching Range, which are designed to assemble, test and launch Indian multi-stage rockets. The Indian launch range is situated in Sriharikota Island, about 62 miles north of Chennai, in southern India.

According to Indian security analysts the Chinese presence on Coco Island should be seen in connection with the Sino-Pakistani defence project and cooperation on the Gwadar Port facilities, which give China access and basing facilities at the other side of the Indian sub-continent, near the Strait of Hormuz. What is especially worrisome from the Indian perspective is the 'maritime encirclement of India', with the Chinese

[197] Retrieved from http://en.wikipedia.org/wiki/Foreign_relations_of_Myanmar.

based at Gwadar to the west of India and Coco Island to the east. In addition, Burma's experiments with a nuclear research reactor is worrisome from an Indian perspective, especially since China, Pakistan and Russia have all been involved in helping Burma. Indian analysts think that the Chinese naval presence in Burma may allow China to interdict regional sea lanes of communication. Due to this, Burma is emerging as the 'single largest threat to Indian strategic interests in South East Asia'.[199] In an effort to check this state of affairs, India has started its own campaign to win over the Burmese regime, by providing military training and selling arms and military hardware to Burma.[200] In addition, Indian President Abdul Khalam recently visited Burma with a new $40 million aid package, along with a proposed natural gas agreement.[201]

Even though India and China seem to regard each other with considerable suspicion, the two countries are faced with several common 'non-traditional' security risks emanating from Burma, including illegal drugs trafficking (opium and metamphetamines), human trafficking and refugees, the spread of HIV/AIDS, and as of lately also avian influenza. Burma has become known as the world's second largest producer of illicit opium, after Afghanistan. It is also the single largest producer of metamphetamines in Southeast Asia. The government lacks both will and ability to take on the major narco trafficking groups and is not seriously committed to remove the money laundering activities that are so essential to keeping up the drugs trade.[202] Burma also has a lot of human trafficking and there is a steady flow of refugees into Thailand, China, Bangladesh and India, and the HIV virus spreads. More than one percent of the Burmese population is estimated to have been infected with HIV.[203] Burma thus has one of the most serious AIDS epidemics in the region, and is reportedly also an epicenter of new strains of drug resistant HIV/AIDS that are

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[198] Ramtanu Maitra 2005, 'The energy ties that bind India, China', *South Asia*, 12 April 2005, available online at: http://www.atimes.com/atimes/South_Asia/GD12Df03.html.
[199] South Asia Analysis Group, Paper no. 682, 7 May 2003, 'Hissing Dragon - Squirming Tiger: China's successful strategic encirclement of India', by Deepak V. Ganapathy.
[200] Testimony by Thin Thin Aung, Women's League of Burma, to the US-Burma Relations Hearing before the Committee on Foreign Relations of the United States Senate, 29 March 2006.
[201] Testimony by Dr. Michael Jonathan Green, Center for Strategic and International Studies, before the US Senate Foreign Relations Committee, Subcommittee on Asia Pacific Affairs, 'The Strategic Implications of the Burma Problem'.
[202] Retrieved from http://en.wikipedia.org/wiki/Foreign_relations_of_Myanmar.
[203] Encyclopædia Britannica online, Myanmar, Year in Review 2006. According to UNAIDS the Burmese health department measured HIV prevalence among military recruits at 1.6% in 2004, while HIV prevalence among pregnant women was estimated at 1.8% in 2004.

spreading to China and India.[204] While the Chinese border town of Ruili has developed into a flourishing trading center, it has also become a focus of Chinese efforts to prevent the spread of HIV from Burma to China.

The issues of drugs, HIV and crime are serious enough, but they also reflect a more overarching concern in India and China about the political stability of Burma. Indian and Chinese authorities are worried that the SPDC may be leading Burma into an ever deepening economic and political crisis, despite that the regime has been provided with substantial income from Thai natural gas purchases over the past few years, and has continued to receive generous provisions of military and infrastructure aid.

[204] Testimony by Thin Thin Aung, Women's League of Burma, to the US-Burma Relations Hearing before the Committee on Foreign Relations of the United States Senate, 29 March 2006.

6. Policy implications

In addition to domestic factors, the Sino-Indian rivalry in Burma contributes to preventing positive change in Burma in the direction of a civilian government or at least a less oppressive regime. For fear of losing influence with the existing regime, India and (notably) China tend to support Burma's military leaders whenever they come under external pressure to change. China is set to maintain a strong strategic interest in Burma, and is using Burmese territory to monitor the Indian Ocean and the entrance to the Strait of Malacca, a waterway of crucial importance to the provision of energy and other necessities to China, Taiwan, South Korea and Japan. The strategic importance of the Malacca Strait has become even greater over the last decade, with China's growing dependence on imported oil. About 80% of all oil supplies to China are currently shipped by tankers through the Strait, and military planners in China fear an embargo in case of war or an acute crisis in their relationship with the United States. China's relations with India, Japan and the US have a strong bearing on its geopolitical interest in Burma. As long as the antagonisms that characterize these relations (in particular the Sino-Japanese relationship) are not fundamentally altered, China will see it as essential to keep up its influence in Burma, and chances are then that future unrest in Burma, whether related to internal strife or opposition to Chinese dominance, will be met with further assertion of Chinese control. This represents a major challenge to any democracy-building efforts in Burma. It may well be that the best way to influence Burma in a positive direction goes through China.

It should be in the Burmese interest to diversify its foreign relations, but SPDC and SLORC have done this only to a limited extent, favouring their relations with China (and Laos and Vietnam). When Burma recently agreed to Chinese pipeline projects both for oil and gas, this drew Burma even deeper into the Chinese sphere of interest, although Burma may now play its three gas customers Thailand, India and China out against each other when negotiating for the best possible price.

The most promising scenario for Burma's political development would probably come about as a consequence of positive developments within China itself. A stable, prosperous, democratizing China might be able to engage constructively with the Burmese regime. This would no doubt provide the best chance of resolving the

current crisis in Burma, and provide the best basis for economic progress. China may well hold the key to Burma's future. Countries in the neighboring region, especially India and Thailand, but also Australia and Japan, may have roles to play, but China wields far more influence in Burma. For those who wish to influence Burma in a positive direction, it is therefore essential to consider ways that this might be done through China.

Sanctions are complex and difficult to assess, and their impact, efficiency and side effects are debated with good reason. However, it is clear that Burma's offshore natural gas is the key source of income for the regime, and will become increasingly important in the years to come. Any recommendation on economic effects of sanctions should take the possibility of depriving Burma of its revenues from natural gas into consideration.

There are three main areas of contention between India and China as far as Burma is concerned, all of which relate to energy security. One regards naval and military intelligence monitoring in the Bay of Bengal and the Strait of Malacca, which will no doubt give rise to fierce 'competition' over assistance to Burma in building deep-sea ports and maritime facilities on its coast and islands, and connecting them through roads and air strips. Secondly, there is tension between India and China concerning Burma's construction of a nuclear research reactor. The fact that China does not provide any direct assistance to Burma in this field may be linked to its current efforts to improve relations with India and the USA. Finally, rivalry over the development of offshore natural gas resources, and the construction of pipelines are complicating the emerging Sino-Indian energy cooperation.