[DRAFT: NOT FOR CIRCULATION]

THE LIMITS TO GROWTH:
CHINA’S STRATEGIC ENERGY DILEMMA

Prepared for the ‘Rise of China’ Conference, Mount Holyoke College, March 7-8, 2008

By Michael T. Klare

After the reforms instituted by Deng Xiaoping following the death of Mao Zedong in 1976 had begun to take effect, China’s economy underwent a fundamental transformation. In place of a Soviet-style, centralized economic system, most industrial firms and agricultural units were empowered to make their own investment decisions, reward productive and creative workers with material benefits, and engage in other market-driven practices. Freed to attract foreign capital and develop new products for export to welcoming markets abroad, Chinese firms posted record gains in output and sales. The net result was an extraordinary surge in economic growth, boosting China’s GDP to $1.1 trillion in 2000 – ten times the level for 1970.

Plunging full-speed ahead into the twenty-first century, China’s economic expansion has shown no signs of slowing down. Annual growth rates during the first six years of the new century have hovered at around 10 percent, and most economists contend that this lofty rate will persist for the remainder of this decade and beyond. In 2004, with a GDP estimated at $1.9 trillion, China moved into sixth place among the world’s largest economies; in 2005, it jumped ahead of Britain and France to become the fourth largest; and many analysts predict that by
the end of 2008 it will overtake Germany for the number three slot. Indeed, some economists believe that if China’s economic results were recalibrated to reflect the artificially low value of its currency, it would already be closing in on Japan as the globe’s number two economic power.¹

China’s extraordinary record of growth has been reflected in a steady accumulation of dollars, yen, euros, and other foreign currencies in its banks and investment accounts; it has taken more concrete form in a mind-boggling countrywide epidemic of industrial expansion, infrastructure development, and personal accumulation. New factories, refineries, power plants, highways, bridges, dams, ports, airports, rail lines, shopping malls, office parks, schools, hospitals, hotels, stadiums, and housing estates have sprung up almost overnight. Small villages have been transformed into cities, cities into giant metropolises. Within these cities, moreover, the material goods owned by ordinary Chinese have grown in size and value. Not everyone, of course, has benefitted from this explosion of personal wealth – tens of millions of impoverished peasants have actually lost ground in these years – but even greater numbers of citizens have done well and they add up to the largest cohort of human beings ever to rise from poverty to middle-class comfort in the space of a single generation.

One way to appreciate this extraordinary boom is to gaze over central Shanghai, the country’s great southern seaport and commercial hub, where some 4,000 new skyscrapers – almost double the number found in New York City – now occupy a crowded horizon. And the future promises more of the same: Another 1,000 skyscrapers, along with gargantuan apartment and shopping complexes, are slated to be built by the end of the first decade of the twenty-first century. Most of these buildings are cooled in summer by air-conditioning; most house computers and other advanced electronic devices as well as a wide variety of modern
appliances, all powered by a vast electrical grid. To transport Shanghai’s estimated 13.5 million people to and from work, moreover, the city is constructing highways at a dizzying pace and adding new lines to its 310-mile subway system, already one of the world’s largest. Traffic congestion is an around-the-clock phenomenon, and subway cars are almost always packed, yet the population continues to grow, swelled by eager or desperate transplants from the countryside, some simply seeking better-paying jobs in the metropolis, others forced off their land and into a world of eternal low-wage employment.

Another impression of this high-speed development can be gleaned by visiting China’s automobile showrooms, where newly affluent consumers are buying motor vehicles in unprecedented numbers. Until the late 1990s, private automobiles were the exclusive prerogative of party functionaries and senior managers; now, ordinary middle-class citizens are lining up to buy cars of their own. “Our living standard has improved to the point where we think it’s time to buy a nice car,” said Sang Guodong, the owner of a small clothing factory, while examining new models at a Beijing dealership. In 2005, customers like Sang purchased a record 5.9 million private vehicles, pushing China ahead of Germany and Japan as the world’s second largest automobile market after the United States. If auto sales continue at their current breakneck pace, China will surpass the United States as the number one market by 2020, when there will be an estimated 130 million cars and trucks on Chinese roads; by 2030 the Chinese vehicle fleet is expected to reach 270 million units.

Supplying power to all the new factories, homes, malls, and office buildings constructed over the past quarter century and propelling the millions of new cars, trucks, and buses on China’s expanding system of roads has involved a staggering increase in electricity output as well as fuel production and importation. In 1990,
China consumed approximately 27.0 quadrillion British thermal units of energy, representing 7.8 percent of world energy consumption; by 2006, its net consumption had jumped to 68.6 quadrillion BTUs, or 15.6 percent of world usage. In that period, it increased its consumption of all major sources of energy, especially coal, which accounted for the largest share of its energy supply, and petroleum, the second leading source. Soaring from 2.3 million barrels per day in 1990 to 7.5 million barrels in 2006, petroleum consumption growth was particularly striking – an increase of over 200 percent.

All such figures pale, however, compared to estimates of China’s future energy demand. According to the most recent projections by the U.S. Department of Energy (DoE), its net energy consumption will climb from 59.6 quadrillion BTUs in 2004 to 145.4 quadrillion in 2030, an increase of 144 percent. If these projections prove accurate, China’s share of world energy consumption will jump from 13.3 percent to 20.7 percent, an extraordinary gain in such a short period of time. To obtain this additional energy, China will have to increase its supply from all potential sources, including coal, oil, nuclear, hydropower, and natural gas. But its projected increase in oil consumption has attracted the greatest notice. According to the DoE, its requirement will jump from 6.4 million barrels per day in 2004 to 15.7 million in 2030, an amount equivalent to projected oil use by Latin America and the Middle East combined.

Historically, Chinese officials have relied as much as possible on domestic energy sources, an approach adopted in the early years of Communist rule to immunize the country as much as possible from the effects of economic and trade sanctions (such as those imposed by the United States on Cuba after the rise of Fidel Castro) and, in an impoverished land, to minimize expenditures on imported commodities. Thanks to the presence of large domestic deposits of oil, coal, and
other key materials, this approach succeeded for a time. But no longer. Domestic oil, for example, will provide only about one-quarter of the country’s anticipated requirement by 2030, with the rest being imported; an even larger share of its natural gas will have to be imported by that time, along with vital supplies of uranium. And while China boasts enormous reserves of coal, many of its deposits are of low quality or located far from coastal urban and industrial centers, and so Beijing has already begun importing even this standard-bearer of energy self-sufficiency.\textsuperscript{7}

Obtaining so much additional energy will prove a formidable challenge requiring an estimated investment of $3.7 trillion over the next twenty-five years, according to the International Energy Agency (IEA).\textsuperscript{8} And yet, every gain in farm and factory output, home and office construction, and consumer lifestyle enhancement will require the use of additional electricity and fuel. To put this in perspective: The added 86 quadrillion BTUs needed to reach China’s projected 2030 energy use is equivalent to Europe’s entire energy consumption in 2007 – representing the combined output of every power plant, refinery, reactor, hydro-electric dam, natural gas field, and wind farm in Britain, France, Germany, Italy, Spain, and a dozen other countries. To acquire this is a Herculean task guaranteed to make or break the Chinese economic miracle.

To satisfy this vast increase in demand, Chinese suppliers will have to increase their delivery of \textit{all} forms of energy, including oil, coal, natural gas, hydropower, nuclear, and renewables (such as solar and wind). As noted, the largest increment to China’s net energy supply is likely to be provided by of coal. According to the DoE, China’s coal consumption is expected to rise by 132 percent between 2004 and 2004, from 41.1 to 95.2 quadrillion BTUs in energy output. But this will also result in a vast increase in the release of carbon dioxide and various
pollutants, making China the world’s leading CO₂ emitter and aggravating its already serious problems with acid rain and respiratory disease. This no doubt will generate enormous pressure on Chinese officials to reduce the nation’s coal consumption and emphasize the use of other energy sources, including oil and natural gas. And even if Beijing were to overlook the environmental consequences of depending so heavily on coal, it cannot rely on this material alone to provide all of the extra energy that it will need: for some purposes, such as transportation, it will also have to obtain expanded supplies of oil and natural gas -- and this where the geopolitical aspect enters the picture.

China was once self-sufficient in petroleum: as recently as 1993, it produced and consumed approximately 3 million barrels per day. But Chinese oil output has increased only slightly – reaching 3.7 million barrels per day in 2006 – while consumption has soared. As a result, the gap between production and consumption has grown bigger and bigger every year, and the only way Beijing has been able to fill that yawning gap has been through increased imports of foreign oil. In 2006, China’s net oil imports amounted to 3.8 million barrels per day, or 51 percent of its total consumption; by 2025, its import requirement is expected to reach 10.8 million barrels, representing 69 percent of consumption. It is to procure all of these additional quantities of foreign oil that Chinese leaders and energy firms have been scouring the world in the search for new sources of supply – wherever these may be found. In some cases, this has led to the signing of contracts for the outright purchase of crude petroleum, but has also entailed the acquisition of equity shares in foreign oil fields, giving Chinese firms a direct role in the production of these firms.

American observers are uncertain as to how much the Chinese government directly oversees the pursuit of foreign energy assets by Chinese firms.
Supposedly, the three major Chinese oil companies – the China National Petroleum Corporation (CNPC), the China National Petrochemical Corporation (Sinopec), and the China National Offshore Oil Corporation (CNOOC) – are designed to operate like independent, profit-making enterprises, conducting their own international operations. However, the government owns a very large stake in these firms, ranging from 80-90 percent, and chooses their top leaders. Government-owned banks also provide low-cost loans to these firms, and Chinese diplomats often facilitate their efforts to negotiate exploration and drilling rights in foreign countries.

“The relationship between the government and oil and gas industries in overseas asset acquisition remains highly opaque, including to what extent government policy directs overseas investment decisions by the industry,” the DoE noted in a Congressionally-mandated review of Chinese energy policy. “Some China analysts view the current overseas asset acquisition drive as government directed, while others speculate that Chinese companies exercise considerable discretion in choosing how much to spend where, and that the government plays the role of evaluating proposed projects and approving the action.”

Either way, the government exercises a significant role in overseeing the overseas operations of the major oil companies.

Although Chinese officials have never spelled out their objectives in wielding such influence, their intentions are clear: to increase the number of countries supplying oil and gas to China and, wherever possible, to gain direct ownership over key foreign reserves. As recently as 1996, China imported 70 percent of its oil from just three countries: Indonesia, Oman, and Yemen. By 2003, it had established ties with a much broader range of suppliers, including Saudi Arabia (providing 16.8 percent of China’s imports), Iran (13.8 percent),
Angola (11.2 percent), and Sudan (4.7 percent). Chinese officials have also traveled the world in pursuit of other sources of oil and gas, establishing supply arrangements and acquiring drilling rights in such countries as Brazil, Canada, Ecuador, Kazakhstan, Nigeria, Russia, and Venezuela.¹¹

That China is vigorously seeking to enhance its access to foreign sources of energy is not, in itself, a source of friction in international relations. After all, the United States, Britain, France, Japan, and other Western oil-importing countries have long competed amongst themselves for drilling rights in overseas producing areas and have managed to divide up the available supplies in a (relatively) amicable fashion. China may be a newcomer to this contest, but is not behaving noticeably different from the other oil-seekers. Indeed, the National Energy Policy announced by President George W. Bush on May 17, 2001 calls for U.S. officials to conduct the same sort of diplomatic quest in pursuit of foreign energy as that now being undertaken by Chinese officials.¹² In a world of ever-expanding petroleum supplies, China would simply find a place at the table and use its abundant stockpiles of cash – much of it dollars obtained in exchange for its voluminous sales of consumer goods to the U.S. market – to buy up whatever energy it required.

There are two major problems with this picture: first, there are growing indications that global oil supplies are not expanding fast enough to keep up with rising world demand; and second, many of the most prolific remaining sources of supply are already controlled by Western energy firms or by producer-owned national oil companies, forcing China to seek development opportunities in marginal areas or “pariah” states shunned by the other major importers.

**Intensified Energy Competition and Its Geopolitical Implications**
For decades, the world supply of petroleum has grown in tandem with the steady rise in international demand. This has made possible the vast expansion of the world economy over the past 60 years and the emergence of new economic powerhouses like China, India, and South Korea. Recently, however, significant doubts have arisen as to the oil industry’s ability to continue boosting the available supply at a rate commensurate with international demand. While some energy analysts insist that this is not a problem and that world supplies will continue to grow as needed, others believe that the expansion of global oil supplies will soon begin to slacken and eventually will zero growth – a condition known as “peak” oil output – after which the supply will begin to contract. Until recently, most oil company executives and government energy experts have sided with those who believe that the moment of peak oil is still safely in the distant future; lately, however, there have been some conspicuous defections from this consensus. For example, in 2005 the CEO of Chevron, David O’Reilly, signed his name to full-page advertisements in some of the nation’s leading newspapers expressing concern about oil’s future availability. “One thing is clear,” the advertisements state, “the era of easy oil is over.” Even more recently, the IEA has warned that global energy industry may encounter difficulty in continuing to meet rising international demand much beyond 2012 because of declining production in older oil fields and a slowdown in the rate of new discovery.

It is impossible, at this point in time, to predict exactly how much oil will actually be available in the decades ahead to meet the anticipated surge in global demand. The Department of Energy comfortably predicts that in 2030 there will be sufficient supply in the market to satisfy projected demand of 118 million barrels per day – an increase of 35 million barrels over current levels of output. If
this projection proves accurate, there will be sufficient oil to meet China’s
projected demand of 15.7 million barrels as well as the 26.7 million barrels sought
by the United States, 15.8 million by Western Europe, and 5.2 million by Japan.
Under this comfortable scenario, prices will remain relatively stable and severe
energy shortages will be averted. But, given the concerns raised by O’Reilly and
others, we can have no confidence that this scenario will prevail. Indeed, it would
be far more prudent to assume that global supplies will not expand sufficiently to
satisfy anticipated demand, that prices will rise significantly, and that the
competition for whatever supplies are available will grow far more intense and
fractious. It is in this context that China’s efforts to secure rising Chinese demand
must be viewed.

How, exactly, this will play itself out cannot be foreseen. But we already
have some early indications. One is price: with China becoming an ever more
significant player in a very crowded energy market, oil prices have risen much
faster than expected even one year ago. In January 2005, the DoE projected prices
in the $30-$35 per barrel range for the period between 2005 and 2025; in February
2008, prices rose over $100 for the first time in history, and show no sign of
dropping much below this. Even more worrisome was the hysterical reaction in
Congress to CNOOC’s June 2005 effort to purchase the Unocal Corporation, a
mid-sized American oil and gas producer. Although CNOOC’s bid for Unocal was
$2 billion higher than that proffered by Chevron, U.S. lawmakers were so incensed
about the possibility that a Chinese company might gain control of American
energy assets that they voted in August 2005 to place insurmountable obstacles in
the way of CNOOC’s purchase; CNOOC then withdrew its offer. The fact that
Unocal’s oil and gas reserves were mostly located in Asia to begin with and played
a negligible role in satisfying U.S. demand made little difference to those who voted against CNOOC.

The Unocal affair did not, in the end, produce a significant breach in U.S.-China relations, and CNOOC has gone on to buy energy assets in other countries, including Nigeria. Nevertheless, the episode demonstrates just how intense the international competition over energy assets has become and the potential that this competition will inflame political ties between the major oil-importing countries. One analyst, Kurt Barrow of Purvin and Gertz (a Singapore-based consultancy), characterized the Unocal affair as the opening salvo in a new “war” over global oil supplies. “CNOOC lost the battle over Unocal,” he told the New York Times, “but will continue to wage the war toward acquiring overseas energy assets to support China’s growing energy needs.”

This may seem overly rhetorical – but it is not seen that way by those in Congress who view China’s avid pursuit of foreign oil assets as a “national security” matter, in the sense of posing a threat to America’s own foreign energy interests. The DoE study cited above, for example, was prepared in accordance with Section 1837 of the Energy Policy Act of 2005, entitled “National Security Review of International Energy Requirements,” mandating a report on “the growing energy requirements of the People’s Republic of China and the implications of such growth on the interests of the United States.” The report itself is generally moderate in tone, but nevertheless concludes that China’s efforts to acquire foreign energy assets “have an impact on strategic U.S. interests.”

The potential for friction arising from an increasingly competitive search for diminishing supplies of oil is made more severe by the second factor in this equation: the fact that many of the world’s most prolific fields are controlled by the major Western oil firms or the producing countries’ state-owned firms, such as
Saudi Aramco and the Kuwait Petroleum Corporation. The state-owned firms dominate production in most of the Middle East, while the Western firms have established a commanding position in such other producing areas as sub-Saharan Africa and the Caspian Sea basin. Chinese energy officials would no doubt like to obtain a foothold in these areas, but have often been frustrated by the well-established presence there of these competing firms. For example, when CNOOC and Sinopec jointly sought to purchase a one-sixth stake in the consortium developing the large Kashagan reservoir in the Caspian Sea, the original members of the consortium, including Exxon-Mobil, Royal Dutch/Shell, and Conoco-Philips, exercised their “right of first refusal” to exclude the Chinese and acquire the stake for themselves.

Having been excluded in this manner from many of the more attractive producing areas, the Chinese have opted for the only path considered open to them: the pursuit of reserves in marginal producing areas and “pariah” states like Burma, Iran, Sudan, and Uzbekistan that have been largely shunned by firms from the United States and its allies. “Chinese companies are prepared to go to countries that may be considered risky to major Western oil companies,” the DoE noted in its 2006 report. “This is due, in part, to the fact that there are few untapped areas for petroleum investment left in the world that are available to foreign investors and, as a latecomer, China seems pushed to invest in areas where other oil companies cannot or will not go.” China’s position in Sudan is particularly noteworthy: CNPC currently holds a 40 percent stake in the Greater Nile Petroleum Operation Company, the leading producer in Sudan, and a substantial stake in other Sudanese consortia; it also built a 930-mile pipeline from southern Sudan to Port Sudan on the Red Sea and a refinery in Khartoum. In Iran, Sinopec
has helped construct a pipeline from the Caspian Sea to Tehran and is involved in the development of natural gas reserves.

The fact that China has established such close ties to countries considered unfriendly to the United States is seen in Washington as provocation enough. But, in its efforts to cement its relations with these suppliers, it has also provided them with military and diplomatic aid, further provoking ire in Washington. “In countries like Uzbekistan, Sudan, and Burma, China has openly supported regimes whose human rights violations, support for terrorism, or proliferation activities have engendered worldwide opposition,” the DoE observed. “As a long-term trend, China’s behavior in this respect runs counter to key strategic goals of the United States.” The seriousness with which top U.S. officials view these activities was noticeably evident in Pentagon’s 2005 report on Chinese strategy and capabilities, *The Military Power of the People’s Republic of China*, which for the first time highlighted energy competition as a significant factor in the U.S.-Chinese security affairs. In a section on “Resource Demand as a Driver of Strategy,” the report observed, “Beijing’s belief that it requires such special relationships in order to secure its energy access could shape its defense strategy and force planning” – thus, presumably, posing a potential threat to U.S. national security.

This concern, it should be noted, is being expressed at a time when China is importing only about 3 million barrels of oil per day, less than one-third of the current U.S. import tally; imagine the degree of alarm we might expect in 2025, when China’s oil imports are expected to rise to 11 million barrels per day, representing approximately two-thirds of America’s projected import requirement. Although it is impossible to predict the future course of U.S.-China relations, it appears safe to assume that disputes arising from the competitive pursuit of foreign
oil will play an increasingly critical role in the relationship, possibly eclipsing such other concerns as Taiwan and two-way trade imbalances.

The Struggle for Natural Gas

So far, we have largely examined issues arising from China’s growing thirst for petroleum. As time goes on, however, China will also need an expanded supply of natural gas – and this, too, could produce significant friction in international affairs.

At present, China consumes a relatively small quantity of natural gas, about 1.4 trillion cubic feet per year – a mere 5 percent of the amount consumed in the United States. But China is expected to consume far more natural gas in the future, mostly to fuel electrical power plants but also as a source for fertilizer, hydrogen, and assorted petrochemicals. As Beijing’s awareness of the environmental dangers of over-reliance on coal grows, moreover, it is likely to depend increasingly on natural gas to generate electricity, further ramping up demand. As a result, China’s gas consumption is expected to grow by 7 percent per year – the highest rate of any large economy. Much as in the case of China’s growing petroleum demand, supplying all of this additional natural gas will prove a major challenge for the government.

Chinese officials would prefer to rely on domestic sources for as large a share of the needed gas as possible, and so has invested considerable funds in efforts to develop promising fields of the Tarim Basin of Western China and to transport this gas to energy-starved areas on the coast. But these sources are not sufficient to satisfy China’s growing needs, and so Beijing has had to look
elsewhere for additional supplies – here again, as in the case of oil, generating various forms of friction in international affairs.

The world’s largest reservoirs of natural gas are found in Iran and the former Soviet Union, and China has sought supplies from both – causing problems with the United States in the case of the former and with Japan in the case of the latter. In October 2004, Sinopec signed a 25-year, $100 billion contract with Tehran for the production and export of up to 10 million tons of liquified natural gas (LNG) to China and for participation in the construction of a refinery for natural gas condensates. Although details of this plan are still being worked out, it could result in a major infusion of new capital into Iran, thus frustrating U.S. efforts to isolate that country (and thereby impede its efforts to acquire nuclear weapons).

The problem with Japan over Russian gas is of a different character, entailing competition over the ultimate destination of gas supplies discovered off the coast of Sakhalin Island, in Russia’s Far East. Japanese firms have provided much of the capital and technology for development of these fields, and Tokyo has always assumed that the resulting output would be carried southward by pipeline to Japan. Recently, however, Chinese officials have been negotiating with the Sakhalin consortium for a substantial share of the field’s gas supplies and for the construction of a pipeline heading westward, to China. Although the Russian government and its corporate partners in the Sakhalin project have yet to decide on the ultimate destination of this gas, the very fact that China has swooped in and attempted to capture a large share of it has produced considerable dismay in Japan.

An even more serious dispute with Japan has arisen over the development of offshore gas fields in contested waters of the East China Sea. Chinese and Japanese geologists believe that considerable gas lies in the Xihu Trough, a deep undersea region located midway between China’s east coast and Japan’s
southernmost islands. Citing provisions of the United Nations Convention on the Law of the Sea (UNCLOS), Japan claims that its offshore boundary lies at the median line between the Chinese and Japanese coasts, putting it directly over the Xihu Trough; China, citing an older rule, insists that its outer boundary extends to the edge of the continental shelf, much further to the east. Recently, CNOOC and Sinopec have been drilling right at the edge of the median line claimed by Japan, sucking up gas from what Tokyo believes is Japanese territory (but China claims is its own). Both sides have periodically deployed warships in the area, provoking a series of threatening naval encounters – none of which has yet entailed actual gunfire, but has every potential for doing so. The gas dispute has also helped stoke rising anti-Chinese hostility in Japan and anti-Japanese hostility in China, complicating efforts to resolve the dispute peacefully.15

It’s Not China’s Problem Alone

Most of the issues and disputes described above derive from a single basic cause: China seeks more energy to sustain its economic growth and satisfy the aspirations of its increasingly affluent citizens, and must do so in a world in which many of the most prolific sources of energy are already owned by or earmarked for the older industrial powers. Of course, in a globalized world economy, China can seek to buy what it needs on the open market, using its abundant reserves of cash. But, like its competitors in the energy marketplace, China has also sought ownership of foreign energy assets or long-term purchase agreements, often putting it into conflict with other energy-seeking powers. As demonstrated by the Unocal affair, this can complicate China’s ties with these countries and provoke an antagonistic reaction with national security overtones. With China’s need for
imported energy sure to grow, and the future availability of abundant oil increasingly in doubt, the danger of international tension and conflict over vital resources will become increasingly severe.

Viewed in this manner, the risk of friction and conflict over energy is not a “China problem” but a global dilemma. Unless the world’s existing powers are prepared to descend into the sort of resource-driven geopolitical competition that resulted in World War I and many smaller conflicts, they must make room at the table for an energy-hungry China. Efforts to exclude China from promising energy deals, like the Kashagan field in the Caspian and the Unocal sale, will only inflame tensions and drive Beijing to pursue more risky arrangements, with unpleasant international repercussions. At the same time, the eventual peaking of oil and the environmental consequences of our shared reliance on fossil fuels can only be addressed on the international level, involving close cooperation among all key parties, including China. It is essential, then, that the international community view China’s strategic energy dilemma in a sympathetic manner and work with Beijing to diversify its sources of energy and, along with the rest of us, to accelerate the development of environmentally-friendly energy alternatives, such as clean-coal technologies, biofuels, wind, solar, and hydrogen.

[Copyright 2008 by Michael T. Klare]


8 IEA, WEO 2007, p. 45.


11 For an inventory of these acquisitions, see ibid., pp. 23-29.


