

## **"Chinese Naval Modernization and Energy Security"**

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## ***Introduction***

This paper addresses China's energy security concerns in the first half of the 21<sup>st</sup> century, with consideration of U.S. influence.

Energy security is defined as "assuring adequate, reliable supplies of energy at reasonable prices and in ways that do not jeopardize major national values and objectives."<sup>1</sup> This includes three primary elements. The first is energy availability: the confirmed location and accessibility of the energy reserves—especially the fossil fuels-- including petroleum, natural gas, and coal—required by an early 21<sup>st</sup> century nation to satisfy its economic demands. Affordability is the second element in energy security: fuel must be available at an acceptable cost.<sup>2</sup>

The third element in energy security is military assurance: this paper focuses on China's ability safely and confidently to obtain and import the required energy supplies. These three elements are not completely discrete, of course, but are linked by common geographical, economic, political, and military threads.

China's emergence as a global power is marked by dramatically increasing energy demand and by naval modernization. The United States' ubiquitous maritime presence in Asia and dominance as a consumer in global energy markets inevitably affects the future of these developments.

China's economy is in the midst of history's longest period of double-digit annual economic growth; that in turn is raising its demand for energy. At the same time, Beijing is modernizing its military to carry out specific national security missions. These two major developments—economic and military—will to a large extent determine the current and future degree of security China expects and may demand for non-domestic energy supplies. Beijing is also very much aware of the American role in any future energy calculus.

## ***Geography***

Although China has been primarily a continental power throughout its history, the country's 11,000 miles of coastline and more than 5,000 islands make it a maritime nation as well. First, China relies on its extensive river network for communication, commerce, and energy production.

Second, coastal waters provide China with critical maritime highways, as do the regional waters of East Asia, the third category of maritime dependence. These seas are of course international bodies of water, and link China to friends and opponents, both current and potential. Hence, any evaluation of East Asian military balances must include these linkages between China and Russia, Korea, Japan, and the nations of Southeast Asia, all of whom are members of ASEAN member states. And the United States, by virtue of its omnipresent naval and air forces throughout the Pacific Ocean and adjacent seas, is linked directly to maritime China.

Finally, the oceans of the world are increasingly vital to China's continued economic growth and national well-being, especially under the aegis of "comprehensive national power" and "peaceful rise" so frequently trumpeted by Beijing. Riverine matters are in the main domestic, although international complications arise from rivers with international borders or whose management affects other nations. The Amur, bordered by China and Russia, is an example of the first; the Mekong (called the Lancang in Chinese), with its headwaters in China

but its primary impact on the nations of Southeast Asia, marks the second case. The Southeast Asian nations' concerns could provide a point of leverage for the United States to counter China's increasing influence in the region.

Coastal waters are those lying within 100 nautical miles (nm) of China's shore, are in part sovereign, in part international, and marked by the thousands of islands belonging to or claimed by China.<sup>3</sup> Of particular note are the islands disputed with Japan, Taiwan, and Vietnam. Coastal waters are also the most sensitive from a naval viewpoint, since their control is absolutely necessary for China to maintain national sovereignty, economic autonomy, and security for both regime and people.

China's regional maritime arena includes the Yellow, East, and South China Seas; the region from Japan and the Korean Peninsula in the north to the Strait of Malacca in the south. China's interests in these waters by definition pose international issues. China shares maritime boundaries and disputes with North Korea, South Korea, Japan, and Vietnam, as well as maritime disputes with the Philippines, Brunei, Indonesia, and Malaysia.

The world's oceans increasingly concern Beijing, since they are necessary for China's continued economic growth, consolidation of its status as a world power, and hence continuation of the Chinese Communist Party (CCP) regime in power. China already deploys the world's second largest merchant marine, trailing only Panama's "flag of convenience" fleet.<sup>4</sup> China's shipbuilding industry is also among the world's most robust, with the largest shipyard in history under construction in the Shanghai estuary. This city is also the principal container port for Northeast Asia, and the third largest in the world. Its maritime importance to China is matched by Hong Kong, which is the maritime doorway to the southern half of China, and the world's busiest container port. In fact, seven of the world's busiest container ports are in China.<sup>5</sup>

China's *2004 White Paper on National Defense* directly addressed the importance of national security interests in the coastal and regional maritime areas.<sup>6</sup> The defense of national sovereignty, territorial integrity, and "maritime rights and interest" were all discussed in this White Paper as "national security goals."

These maritime interests in turn include energy resources, both proven and estimated, that are increasingly of vital importance to China. The White Paper also notes the "priority [of] the building of the Navy, Air Force and Second Artillery force." PLAN strategists also appear to view the American presence in Japan, Taiwan, and the Philippines as forming a "blockade" of China's legitimate maritime security interests.<sup>7</sup>

In the near term, Beijing's efforts to build a navy able to satisfy these maritime security concerns focus on Taiwan; in the mid-term, they include the disputes with Japan over natural gas deposits in the East China Seabed and with the claimants to South China Sea territories. Beijing and Tokyo recently concluded their fourth round of talks about the East China Sea dispute, still without reaching a settlement. Both sides remain intransigent, insisting on a broad interpretation of sovereignty in the area.<sup>8</sup>

China has signed two significant diplomatic instruments with respect to disputes in the South China Sea. In 2002, Beijing and the other claimants to South China Sea land features agreed in a written concordat to resolve their claims peacefully; in March 2005, China, the Philippines, and Vietnam signed an agreement to conduct joint seismic petroleum surveys in

disputed areas of the South China Sea. The effort is estimated to last three years and cost \$15 million.<sup>9</sup>

### ***Energy Sector Vulnerabilities***

Beijing's longer term maritime security interests are particularly germane to this essay, reaching beyond Taiwan and East Asian sovereignty issues to focus on the long sea lines of communications (SLOCs) on which China depends for petroleum imports from Southwest Asia. Currently, the security of these long SLOCs is guaranteed by the U.S. Navy; nonetheless, Beijing's maritime concerns are global in the long term and central to consideration of future Chinese strategic thought.

### ***Petroleum***

China's economy is growing faster than its available energy supply, especially with respect to declining domestic petroleum production. In 2002, the nation surpassed Japan to become the world's second largest oil consumer, behind the United States. China's oil consumption grew by over 55 percent from 1994 to 2000, while its oil production increased by 11 percent. Consumption then increased by 42 percent between 2001 and 2005, while production went up 25 percent.<sup>10</sup> This disparity between domestic production and consumption indicates how fast China's energy demands will almost certainly continue to grow, as disposable income increases and WTO membership results in lower automobile prices for the huge population.<sup>11</sup>

Indeed, *per capita* oil use in China currently is nearly thirty times less than that in the United States.<sup>12</sup> The Chinese Academy of Geological Sciences has estimated that the national demand for oil in 2020 will be 700 million tons, while domestic production will not exceed 200 million tons.<sup>13</sup> The nation still has unexploited reserves, both proven and estimated, but these amount to just 2.3 percent of the world's total, and will be inadequate for China's energy needs.<sup>14</sup>

China's energy production-consumption equation is further unbalanced by two factors. First is the inefficiency that is endemic in the petroleum industry; most Chinese refineries operate at financial losses usually hidden by state ownership. For instance, the estimated cost per barrel of Chinese refining is \$1.50; the cost for Western refineries is 1.20. Similarly, natural gas exploration costs for Chinese firms are \$3.90; that for Western firms is \$3.00.<sup>15</sup> Second, the United States has not adopted meaningful energy consumption reduction measures since the 1970s; indeed, the restrictions instituted following the 1973 oil shock have been relaxed. Hence, U.S. petroleum consumption will continue to rise and continue as a direct competitor to Chinese requirements.

### ***Natural Gas***

Natural gas has not been a major fuel in China, but offers an attractive alternative to coal and could relieve reliance on imported oil. Gas currently accounts for less than 3 percent of total energy usage in China, however, compared to a world average of 24 percent and an Asia-wide average of 8.8 percent. Beijing is trying to boost its production and consumption, but with little success to date.<sup>16</sup>

Beijing wants gas to provide 8 to 10 percent of the nation's total energy consumption by 2020.<sup>17</sup> This will increase the reliance on imports, either by pipeline or in the form of liquefied natural gas (LNG).<sup>18</sup> The import issue is complicated by the fact that in its natural form, gas can

be piped only a limited distance without being liquefied. Furthermore, for liquefaction to be economical, the gas deposit must be 3 to 5 trillion cubic meters (tcm) in size.<sup>19</sup> This has possible, surprising international political implications, since liquefaction plants need to be located near the source of the natural gas. Hence, cooperative relations will be needed between China and the nations of Southeast Asia, the location of extensive natural gas resources.

There is no doubt about Beijing's deliberate, well-funded global effort to locate and secure energy supplies, an effort dependent on being able to use long SLOCs. Furthermore, China is already concerned about its present reliance on Middle Eastern sources of energy supplies, which provides at least 60 percent of China's imported oil.<sup>20</sup> This heightens Beijing's strategic interest in an area also of key concern to Washington, posing a competitive situation with naval as well as economic aspects.

Barring a currently unforeseen domestic bonanza, importing foreign petroleum will likely to remain Beijing's only option for increasing the supply of petroleum, an option it is pursuing worldwide, with recent investments in exploration and production in Southeast, Southwest, and Central Asia (including the Caspian Basin); North and South America; the Middle East; and sub-Saharan Africa.<sup>21</sup>

China is making an extensive effort to include the energy sector in any strategic partnership with Moscow; similar efforts are being made with Russia's former republics in Central Asia. Extensive programs have been launched in Kazakhstan, for instance, with whom Beijing has signed agreements and contracts and from whom it has purchased a small amount of oil. Significant shipments of oil to China from the central Asian nation remain far in the future, as the project's feasibility study, originally scheduled for completion in late 2004, remains incomplete.<sup>22</sup>

With respect to Siberian reserves, China's task is relatively straightforward: convince Russia to build the pipeline either directly across their common border to Daqing or, a poor second best (but still preferable to a pipeline to Nakhodka), to build a pipeline to China across Mongolia. Despite the economic and technical factors affecting the selection of a route for a Siberian pipeline, Moscow's final decision will most likely reflect political rather than economic factors. The current state of good relations between Russia and China is unprecedented in length and historical factors of mistrust and fears may reasonably be expected to cool the relationship to the point where Moscow would simply be too uncomfortable with a routing that placed control of the pipeline terminus in Chinese hands.

Indeed, in early March 2006, Beijing expressed its dissatisfaction "with the development of energy cooperation with Russia," based largely on the lack of progress in selecting a route for the Siberian pipeline. Zhang Guobao, Deputy Director of the Chinese National Development and Reform Commission, stated that while "Russia has undertaken various oral obligations," there "has been no practical progress."<sup>23</sup>

Russia, however, has pointed out that while the "Resolution of the Russian Government #1737 of 31 December 2004, demonstrates "the political will of the Russian Government to take specific steps in the development of the Eastern direction of the Russian oil exports," the decision about the "Far East Pipeline...still remains tentative and leaves far too many uncertainties," some of which are credited to "the Chinese factor still remain[ing] a mystery."<sup>24</sup> The most likely outcome is for the pipeline to be built to Nakhodka, with a spur constructed to

Daqing or some other Chinese terminal. U.S. strategists should take satisfaction in the lack of agreement between Moscow and Beijing.

China currently is pursuing oil and natural gas reserves wherever located, around the world. This has led to many investments considered inefficient by global energy companies, but the relatively closed nature of China's economy, especially the state controlled energy sector, is allowing Beijing to pursue a very active acquisition policy.

### ***Defense of the Energy Sector***

China also is seeking to emulate the United States by establishing a strategic reserve of petroleum supplies (ninety days worth, in Beijing's case) to counter fluctuations in the international oil market.<sup>25</sup> This plan is in progress, with the first of at least four petroleum reserve bases under construction near Shanghai, with others to be built along China's coast. Two bases will be located in Zhejiang and Shandong Provinces, while the fourth will be built in Northeast China's Liaoning Province.

Guangdong Province officials are also campaigning for such facilities, to "ensure the economic security of the [Pearl River] delta."<sup>26</sup> The non-military character of these strategic reserves is evidenced in their planned construction as above-ground tank farms near China's vulnerable coastline, and leads to the conclusion that Beijing's interest in securing energy supplies springs primarily from an economic rather than military rationale. People's Liberation Army (PLA)

The PLA is deeply involved in the nation's hunger for non-domestic energy resources. Although China has been a net energy importer for more than a decade, the country retains more than adequate supplies to meet all conceivable PLA missions to defend Chinese vital national security interests. The PLA thus can count on China's indigenous petroleum supplies to fuel its platforms; another resource for the PLAN is nuclear power, already used in six operating and three under-construction submarines.

The military is specifically assigned a role in modernizing and expanding China's energy infrastructure. Beijing's 2002 Defense White Paper notes PLA participation in "the construction of nine energy facilities such as pipelines, natural gas fields and oil-and-gas fields; the construction of seven hydropower stations and nineteen trunk diversion channels [and for] the protection and construction of the ecological environment."<sup>27</sup>

The PLA will continue to serve as the "police force" of last resort, should civilian and PAP authorities require assistance. The Central Asian member-states of the Shanghai Cooperative Organization represent one of Beijing's most significant efforts at multilateralism and delineate the theater most likely to demand PLA missions in the realm of protecting continental energy resources. Xinjiang's energy resource infrastructure, including the Tarim Basin fields, conceivably is a target of Uighur separatists.

Beijing has built more than a half-dozen major pipeline projects; others are under construction or being planned.<sup>28</sup> As demonstrated by T.E. Lawrence in the Middle East during World War I and currently by the Ejército de Liberación Nacional (ELN) in Colombia, pipelines can be difficult to protect.

The PLA is perhaps most directly involved in China's search for energy security through the maritime role of securing SLOCs and ocean bed energy fields. Here, the United States is viewed as the likely force that will have to be countered.

It would be difficult for even the U.S. military to interrupt China's SLOCs over which international energy flows, but these appear vulnerable to PLAN eyes. Should the United States attempt physically to interrupt either SLOCs or overland pipelines, it would almost certainly mean directly attacking China, directly attacking other nations (hosting pipelines and their pumping stations), interfering with the peacetime passage of third-country tankers at sea, or all of the above.

The SLOCs are most vulnerable not on the high seas, but at transit points through narrow straits, including Hormuz, the 9-Degree Channel, Malacca, Luzon, and Taiwan. The most likely tactic for an opponent to employ would be a blockade of Chinese oil port terminals, or of these chokepoints. Such actions would be acts of war against China and other nations, and also would likely not succeed in significantly reducing China's overall energy supply.

Nonetheless, petroleum imports from Southeast Asia and the Middle East, including the Persian Gulf, face a long seaborne transit. And the Gulf is the source of 60 percent of China's imported oil, while most of its imported natural gas comes from Southeast Asia.<sup>29</sup>

Beijing's decision-making process for the question of using the PLAN to ensure energy security will include three primary factors. First, how secure does the CCP leadership feel about their place in power in Beijing? Second, how willing is the Chinese leadership to rely on the world energy market to ensure the affordability, availability, and safe passage of imported supplies? Third, how confident is the leadership about U.S. peaceful intentions, possibly in the face of contentious Chinese actions, such as increasing military pressure against Taiwan? Finally, how much confidence does the leadership have in PLAN capabilities?

The U.S. Navy will protect these SLOCs for the foreseeable future, but a Sino-American crisis (over Taiwan for instance) might drive Beijing to decide that the PLAN had to be capable of defending these SLOCs. The way for China to preclude this eventuality is to resolve Taiwan's status peacefully and to develop continental pipelines as the primary avenue for accessing foreign oil sources. Failing that, Beijing would have to make a major change in national budgeting priorities to build a navy and air force capable of protecting the extended SLOCs that carry much of China's imported oil and natural gas. This degree of PLA growth is inhibited by several factors.

First, Beijing's national priorities continue to fall under the rubric of "rich country, strong army": developing China's economy and ensuring the welfare of its people remains the government's and the CCP's top priority. Second, while Taiwan remains the most sensitive issue between Beijing and Washington, the present economic and political situation on the island, U.S. and Chinese interest in keeping the issue within peaceful bounds, and common interest in the campaign against terrorism, all mitigate against the reunification issue deteriorating to the point of hostilities. Hence, Sino-American relations should remain peaceful, if frequently contentious.

Third, there is little indication that the Chinese military's strategic paradigm is going to change significantly in the near future. The PLA remains dominated by the army, with the navy only as strong as specific maritime-associated national interests justify. Current PLAN modernization seems fueled by increased national revenues rather than by a reordering of budgeting priorities within the PLA.

### *People's Liberation Army-Navy (PLAN) Modernization*

China's navy has been modernizing since its inception in 1950, but this process intensified during the 1980s and in 1996 received particular motivation that remains in effect. China's naval airpower remains restricted to shore-based fixed wing aircraft, with only limited numbers of helicopters operating from shipboard.

The former category is made up for the most part of fighter and bomber aircraft, although a force of longer-range aircraft capable of launching anti-ship cruise missiles is maintained. The PLAN Air Force (PLAN-AF) is notably deficient in anti-submarine warfare (ASW) and long-range search aircraft; its airborne electronic warfare (EW) capability is also weak.

The PLAN's helicopter force is small, but growing in capability and numbers. Especially significant has been recent at-sea exercises demonstrating the navy's emphasis on operations between ships and aircraft, both fixed- and rotary-wing. PLAN combatants also have finally achieved the capability of data-linking with embarked helos.<sup>30</sup>

The Chinese navy currently includes fewer than 20 warships capable of operating in an early 21st-century naval environment. And these ships—4 *Sovremenny*-class, 1 *Luhai*-class, 2 *Luhu*-class guided-missile destroyers (DDGs), and approximately 12 *Jiangwei*-class guided-missile frigates—are armed with very limited anti-air warfare weapons systems. The U.S. Navy, by contrast, deploys more than 50 Aegis equipped ships alone.

Another 40 or so Chinese surface combatants are armed with anti-surface ship cruise missiles and, in a non-air and non-subsurface threat environment could defend coastal SLOCs against surface raiders. The PLAN ability to deploy at extended ranges is further limited by the presence of only five replenishment-at-sea ships in the fleet. Again by contrast, the U.S. Navy operates more than 30 such ships.

PLAN surface forces are improving at a steady pace, in capability and numbers. Older destroyers and frigates are being replaced at a measured pace by newer, near state-of-the-art combatants. The most recent classes appear to include ships equipped with an area-capable anti-air warfare (AAW) system, which would be a very significant advance for the PLAN, which hitherto has been incapable of operating safely in a hostile air threat environment.

The navy's most potent strength lies in its numerous, modernizing submarine force. The five nuclear-powered *Han*-class attack submarines are capable of extended deployments but are noisy and difficult to maintain. Its nuclear powered submarine force will soon improve as the new Type 093-class becomes operational. With the advent late in this decade of the Type 094-class fleet ballistic missile submarines, China will for the first time deploy a dependable maritime nuclear deterrent force.

The PLAN currently deploys an impressive and improving force of conventionally powered submarines. The 12 *Kilo*-class and 12-15 *Song*-class conventionally powered attack boats are not well suited for long-range deployments (to the Indian Ocean, for example), but are formidable weapons systems within about 1,000 miles of China's coast.

The new *Yuan*-class boat unveiled in the summer of 2004 appears to incorporate Russian *Amur*-class characteristics and may become a platform for installation of air-independent-propulsion (AIP). Beijing continues to build *Songs* and buy *Kilos* from Russia; as these boats become operational, the 30 or 40 older *Ming*- and *Romeo*-class boats will probably be



decommissioned. The United States deploys only nuclear powered submarines, including 48 attack boats and 18 ships equipped with either ICBMs or land attack cruise missiles.

The PLAN presently is capable only of defending littoral SLOCs (those lying no more than 200 nm from China's coast). Even that capability must be qualified, however, given the proven difficulty of defending surface ships against submarine attack.<sup>31</sup> Defense of China's economic offshore infrastructure is a prominent PLAN concern; the South China Sea would become an area of primary operations should significant energy resources be discovered in waters claimed by Beijing in that sea. PLAN forces have regularly deployed to the Paracel Islands since the early 1970s and to the Spratly Islands since the early 1980s. A Chinese military presence has been established on more than a half-dozen of the islands.

The current maritime strategy is one of offshore defense, meaning that the PLAN will strive to "maintain control over the maritime traffic in the coastal waters of the mainland" and the resources in those waters.<sup>32</sup> Defining this area of capability is not easy, but perhaps the most reliable approach is to look at specific missions and sea lines. This approach yields formidable ocean areas for the PLAN to defend: all of the South China Sea, the western half of the East China Sea, the waters extending from the Chinese coast to at least 100 nm east of Taiwan along a line from the Philippines to Japan, and all of the Yellow Sea.

Continued constructive relations with the nations of Southeast Asia should relieve Beijing of concern for commanding the seas of the narrow Malacca Strait. Defense of more distant SLOCs, from the Malacca Strait between the South China Sea and the Indian Ocean, to the Hormuz Strait from that ocean into the Persian Gulf, would require a quantum leap in PLAN capabilities. Conceivably, however, China could choose to deploy PLAN units as part of a multinational force.

### *SLOC Defense*

As for the vast Indian Ocean distances between the two straits, China faces a wary India with a formidable navy of its own. Beijing's close relationship with Pakistan is marked by significant military assistance to a navy that also is able to count on French submarines and other foreign assistance. Pakistan's force of seven modern, conventionally powered submarines is augmented by eight frigates—none of them new, but most armed with guided missiles—and two replenishment-at-sea oilers.

China is also helping Pakistan build a deepwater port at Gwadar, nominally for commercial traffic. This port is located in Balochistan, however, perhaps Pakistan's least stable province. And its usefulness as an oil pipeline terminus is constrained by the extremely difficult terrain through which a pipeline would have to pass to reach the port.<sup>33</sup> Furthermore, Islamabad has consistently come out second-best in wars with New Delhi, and the advent of the two nations as nuclear powers casts future contests in a different light, especially as India's nuclear arsenal forms its only way of effectively threatening China.

Beijing has begun establishing a military presence in the Indian Ocean and hopes its close relationship with Islamabad will allow it to count on the Pakistani navy in a regional maritime contest. China also has established a strategic economic and military relationship with Burma by providing advisors and material assistance. The Chinese military and contractor personnel in that country—involved in projects ranging from road-building in the far north to manning

listening stations in the Andaman Sea—represent the first Chinese military presence on foreign soil since the Vietnam War, other than PLA participation in UN peacekeeping missions.<sup>34</sup>

Beijing's policy in Burma is motivated by several factors. First is concern for their common border, rife with drug traffickers and other smugglers, and at one time a refuge for former Nationalist soldiers. Second is the desire to counter Indian influence in the region—important because of its location between the subcontinent and Southeast Asia, an area to which Beijing is devoting increasing political and economic resources.

Third is concern for the Indian Ocean SLOCs on which China depends for so much of its energy imports. At the same time, India is trying to establish a stronger political and naval presence east of Malacca, evidenced in New Delhi's increased attention to ASEAN and the 2001 deployments by the Indian Navy to East Asia, from Singapore to Japan.<sup>35</sup> These events, combined with Indian naval strength in the Indian Ocean, pose a classic problem in maritime strategy for Beijing: its most important source of petroleum imports, the Persian Gulf area, lies at the end of very long SLOCs that are dominated by the navy of a potential enemy.

The naval picture of the Indian Ocean, apart from the usual American presence of one or two aircraft carrier battlegroups, is dominated by an Indian force much stronger than its Pakistani opponent. The PLAN is stronger than either, but its presence in that distant region is limited by the distances involved.

How will China address the problem of Indian Ocean SLOCs? Beijing apparently has decided not to build a navy capable of patrolling these long SLOCs to the Middle East. Instead, Beijing is forming supportive relationships with the nations bordering those routes, from Vietnam and the Philippines to Saudi Arabia.

Given China's significant draw on Middle Eastern-Southwest Asian oil, a prolonged war in that region might well seriously disrupt the outflow of petroleum products. To forestall or ameliorate that eventuality, Beijing is engaging in diplomatic activity both to signal its interest in the welfare of the Arab states and to offer mediation services in the Israeli-Palestinian conflict.<sup>36</sup> This activity backs up and possibly extends Beijing's activities with petroleum companies in the region, including investments or extraction activities in Iran, Iraq, Kuwait, Saudi Arabia, Egypt, Sudan, and Somalia.

Unrest in Southeast Asia also has the potential to disrupt the maritime oil flow to China. The political situation in that region is so fractured, however, as to make effective multilateral action against freedom of navigation extremely unlikely. Even if the Malacca Strait–South China Sea route was interrupted, oil could be shipped via alternate routes at an acceptable increase in cost.<sup>37</sup> These options include rerouting tankers through other straits in the Indonesian archipelago or completely around Australia. Other alternatives currently being discussed include building a canal or pipeline across the Kra Isthmus, a pipeline north through Burma or through Thailand to China.

### ***Conclusion***

China's leaders are well aware of energy issues and maritime interests as vital elements in their nation's economic health and their own political legitimacy, and the PLAN is tasked with energy security as a mission. But China's concern for the security of its overseas energy supplies does not dominate its national security policy process, and the most important aspects of energy security for Beijing are economic and political, not military.

While China currently imports approximately 45 percent of its oil, this is only slightly more than 6 percent of its national energy needs.<sup>38</sup> The chairman of the China National Offshore Oil Corporation (CNOOC) has stated flatly that “China’s oil demand will remain fairly stable” and will not expand as some analysts have predicted.<sup>39</sup> Furthermore, China has codified the world’s most stringent automobile efficiency standards and announced “a sharp tax increase on big cars and a matching reduction for smaller models”; additionally, Beijing’s State Council Energy Leading group has delineated an “oil alternative strategy,” which prioritizes gas over oil, coal over either, and renewable energy (hydro, wind, solar, biomass, nuclear) over fossil fuels.<sup>40</sup>

Perhaps most significantly, coal will almost certainly remain the source of at least 70 percent of China’s total energy requirements for the foreseeable future. That dependence poses problems of inefficiencies and environmental deficiencies, but these are amenable to technical solutions and do not detract from the very considerable “comfort blanket” provided to China by its huge coal reserves, third largest in the world.

Beijing is also concerned about growing reliance on foreign ships for petroleum carriage. Speaking at a January 2004 energy industry conference, Zhang Guofa, Deputy Director of China’s Water Transport Department of the Ministry of Communications, noted that while 90 percent of China’s crude oil imports came by sea, only 10 percent is transported by Chinese flagged carriers.

The present 50 million tons of oil imported by sea in 2003 was estimated to grow to 75 million tons by 2010 and to 130 million tons by 2020. Current Chinese tanker capacity of 5.2 million tons was targeted to grow to 10 million tons in the near term, but that would still be far too inadequate to reduce the risk of China getting “in trouble once emergencies such as wars occur.”<sup>41</sup>

The maritime dispute with Japan may pose the most serious risk of possible armed conflict between the two nations’ navies, despite the relatively modest amounts of energy resources contained in the disputed Chunxiao natural gas field. But almost certainly, any clash would be brief and quickly resolved by Tokyo and Beijing.

The South China Sea is potentially contentious, because of the number of claimants to the bits and pieces of land that dot that body of water. Little chance of armed conflict presently exists, however, primarily because no significant energy reserves have been found in the disputed central areas of the Sea. In fact, China, the Philippines, and Vietnam have signed an agreement to jointly explore the area.<sup>42</sup>

There are two certainties in assessing the military element in energy security for China. First, Beijing is building and deploying a new navy; second, China is dependent on imported energy supplies to maintain its growing economy, which in turn is necessary to maintain societal cohesion and the CCP in power. These two facts and Beijing’s concerns about potential U.S. interference do not, however, necessarily mean that future energy security concerns will lead to armed conflict with the United States.

In closing, let me address the six questions posed by the Conference organizers to assess China’s progress in achieving naval energy security:

- What progress has the PLA made in preparations to defend energy sources and transportation routes in Asia or further abroad?

Very little; current PLAN modernization is focused on Taiwan scenarios, with capabilities only beginning to reach regional operations.

- The PLA has demonstrated pockets of innovation and expertise, but what success have they shown in developing broad gauge power projection land, naval, or air forces?

Again, very little. Two new replenishment-at-sea (RAS) ships, which may augment or replace two of the PLAN's previous three RAS units, are the first solid sign of power projection capability. Seaborne air capability remains almost non-existent.

- What progress has the PLA made in moving from a peoples army to a professional, career force? Have they been successful in developing flexible and adaptive leaders?

The first of these questions underlines the most significant aspect of PLAN modernization in the past decade or more. The navy has completely overhauled its personnel training and education system, to include officer procurement. The loss of the *Ming* 319 submarine in 2003 likely also caused a significant overhaul of the PLAN's maintenance infrastructure. This apparent improvement would indicate that the PLAN has succeeded in developing "flexible and adaptive leaders," but it is far too soon to know for certain. For one thing, no current PLAN officer has experienced significant combat; for another, the PLAN is very rarely interacts with foreign navies, thus limiting its ability to learn from proven maritime forces.

- What progress is the PLA making towards developing and producing its own designs for high-technology combat equipment, to include the modernization its conventional ballistic missile and strategic nuclear forces and the supporting C4I systems?

While China's military-industrial complex (CMIC) is undoubtedly making progress in developing the ability to conduct a complete laboratory to operating process for new military technology, it still relies heavily on foreign designed and sometimes foreign manufactured systems.<sup>43</sup>

- How capable/effective have PLA forces that have deployed in peace support or humanitarian assistance missions been at those tasks?

Chinese detachments assigned under UN auspices to Liberia, Cambodia, East Timor, Haiti, and the Middle East appear to have performed well. The PLA's ability to respond to environmental disasters or other humanitarian emergencies is limited almost entirely to domestic locations, due to its lack of long-range transportation assets and power projection platforms.

-What role do military exchanges and security cooperation play in the PLA's plans to modernize, or as a mission of the PLA?

PLA modernization, especially where concerning the PLAN, depends heavily on foreign assistance and systems, particularly from Russia. Military exchanges and security cooperation from other nations is minimal, although the PLA has received systems and technology from the United States (prior to 1989), Israel, France, and other Western European nations. The increasing advent of dual-nature technology makes this issue increasingly difficult to monitor, let alone control.

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<sup>1</sup> Daniel Yergin, “Energy Security in the 1990s,” *Foreign Affairs*, Vol. 67, No. 1 (Fall 1988), p. 11.

<sup>2</sup> Discussion of various aspects of these elements is ably presented in “The PRC’s Global Pursuit of Natural Resources,” (Seattle, WA: The National Bureau of Asian Research, 2006), especially the essay by Philip Andrews-Speed et al (“Natural Resources Strategy and Resource Diplomacy”) and Aaron L. Friedberg (“‘Going Out’: China’s Pursuit of Natural Resources and its Implications for Grand Strategy”). Also see Erica S. Downs, “The Chinese Energy Security Debate,” *The China Quarterly*, No. 177 (March 2004), pp. 21-41. China undoubtedly possesses significant oil and natural gas reserves, but estimates of their size is admittedly very tenuous: see “Most of China’s Oil and Gas Reserves Wait to be Verified,” *Xinhua*, Beijing (05 March 2006), in *Alexander’s Gas & Oil Connections*, Vol. 11, Issue #10 (18 May 2006), at [www.gasandoil.com](http://www.gasandoil.com).

<sup>3</sup> One nautical mile equals approximately 1.2 statute miles. Maritime sovereignty is defined by the 1982 United Nations Convention on the Law of the Sea (UNCLOS), which has been accepted—if not formally signed and ratified—by almost all the world’s nations with coastlines. Briefly, it delineates four primary areas of national maritime control: (a) the Territorial Sea extends from a nation’s coastline 12 nm seaward and gives sovereign rights over the sea, airspace above it, seabed and subsoil; (b) the Contiguous Zone (CZ) extends from a nation’s coastline 24 nm seaward and gives the control to prevent and punish infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea; (c) the Exclusive Economic Zone (EEZ) extends to a maximum of 200 nm from a nation’s coastline and gives sovereign rights with respect to natural resources and certain economic activities, and exercise jurisdiction over marine science research and environmental protection; (d) the Continental Shelf (the national area of the seabed) may be claimed out to a maximum distance of 350 nm from a nation’s coastline and gives sovereign rights for exploring and exploiting the seabed.

<sup>4</sup> *CIA World Factbook*, at <http://www.cia.gov/cia/publications/factbook/rankorder/2108rank.html>.

<sup>5</sup> “China Has Seven World-Level Ports,” Beijing, *People’s Daily Online*, at: <http://english.peopledaily.com.cn>.

<sup>6</sup> This (and other Chinese defense White Papers) may be found at <http://www.china.org.cn/e-white/index.htm>.

<sup>7</sup> PLA General Wen Zongren, of the Academy of Military Science, cited in the U.S. Department of Defense (DoD), *Report on The Military Power of the People’s Republic of China, Report to Congress 2005*.

<sup>8</sup> The dispute is summed up in Rich Chapman, “Japan-China: Disputed Gas Talks Have Familiar Ending—A Special Press Summary,” U.S. Pacific Command’s Virtual Intelligence Center (referred hereafter as “VIC Site”): at [www.vic-info.org/RegionsTop.nsf/ce7a71ce2912c7330a25707c0065b5f9/2d5cf58d253ee2bfoa257131000177a3?](http://www.vic-info.org/RegionsTop.nsf/ce7a71ce2912c7330a25707c0065b5f9/2d5cf58d253ee2bfoa257131000177a3?), 13 March 2006.

<sup>9</sup> The 2002 “Declaration on the Conduct of Parties in the South China Sea” falls short of the legally binding “code of conduct” desired by the other signatories. The 2004 Tripartite Agreement is described at: <http://www.china.org.cn/english/2005/Mar/122853.htm>.

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<sup>10</sup> U.S. Department of Energy (DOE), Energy Information Administration (EIA): Tables 2.4 and E.1, at <http://www.eia.doe.gov/emeu/cabs/china.html>.

<sup>11</sup> “Beijing Posts Sharp Increase in Auto Sales,” *Xinhua* (30 January 2003) in FBIS-CPP20030130000071; “Fueling China’s Growth,” *The New York Times* (26 December 2000).

<sup>12</sup> Manning, p. 104.

<sup>13</sup> Cited in Takio Murkami, “China Becomes World-Class Oil Buyer,” *Asahi Shimbun* (Tokyo), 23 July 2003, in *Alexander’s* 8, no. 16 (21 August 2003).

<sup>14</sup> Liu and Qi, p. 2, also note that over 65 percent of the world’s estimated reserves are located in the “Middle East region.” Russia and the United States hold approximately 6 and 3 percent, respectively.

<sup>15</sup> Cited in Felix Chang, “Chinese Energy and Asian Security,” *Orbis* 45, no. 2 (Spring 2001), p. 226.

<sup>16</sup> Peng Sen, Vice Minister of the Economic Restructuring Office of the State Council, quoted in “China Needs to Establish Downstream Gas Sector Regulatory Framework,” *Xinhua* (10 April 2002) in *Alexander’s* 7, no. 9 (3 May 2002), and Chen Li, a “senior official” in the same office, in “Chinese Experts Call for Establishment of Gas Market Watchdog,” *China Daily* (9 April 2002) in *Alexander’s* 7, no. 9 (3 May 2002). Also see “The Bulls Are Back,” *Petroleum Economist* 67, no. 11 (November 2000), pp. 38–39.

<sup>17</sup> The 8 percent figure is cited in “China’s Modernization May Be Slowed Down by Oil Shortage,” *People’s Daily*, in *Alexander’s* 6, no. 15 (14 August 2001); Mai Tian, “Sinopec, PetroChina Reach Agreement on Pipeline Project,” *China Daily* (6 October 2001), in FBIS-CPP20011006000032, reports the goal as 10 percent.

<sup>18</sup> LNG is natural gas that has been cooled to approximately -260 degrees Fahrenheit. It has a 610:1 volumetric advantage over its natural state and is much easier to ship and store.

<sup>19</sup> Author’s interview of geologist at the East-West Center, Honolulu (November 1999).

<sup>20</sup> Reliance on Middle Eastern oil as a strategic vulnerability is emphasized in Lui and Xi. Also, Mai Tian, in “Crude-Oil Imports Show Surge,” *Beijing China Daily* (Hong Kong edition), 2 July 2003, in FBIS-CPP20030722000020, reports the 2003 increase as coming from China’s National Petroleum Corporation.

<sup>21</sup> “Jiang Zemin, Qadhafi Ink Deal to Open Libyan Oil Sector to PRC Firms,” *Agence France Presse* (AFP), 14 April 2002, in FBIS-CPP20020414000057; Cao Xiaoxi, quoted in Xie Ye and Huo Yongzhe, “Oil Giants Map Out Overseas Takeovers,” *China Daily* (Business Weekly Supplement), 5 February 2002, in FBIS-CPP20020205000060. Also see “CNPC Raises 2002 Production Forecast,” *Reuters*, in *Alexander’s* 7, no. 3 (6 February 2002); “Sinopec Group and Sinochem to Buy Middle East Oil Assets,” *Reuters*, in *Alexander’s* 7, no. 8 (18 April 2002), also reported that Sinopec has requested permission from Kuwaiti authorities to join in a \$7 billion “Northern Fields” project. Also see “Oman and China Sign Oil Cooperation Agreements,” *Asia Pulse*, in *Alexander’s* 7, no. 8 (18

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April 2002). Sinopec's plan to invest \$525 million in Algeria is reported in "Chinese Company Wins Contract," *Radio Algiers* (1 October 2002) in FBIS-GMP20021001000257.

<sup>22</sup> "Feasibility Study on Kazakhstan-China Pipeline to be Ready in 2004," *Moscow Interfax* (9 October 2003) in FBIS-CEP20031009000374.

<sup>23</sup> Quoted in "Beijing Says Not Fully Satisfied with Oil, Gas Cooperation With Russia," *Moscow Interfax* (03 March 2006), in FBIS-CEP20060303027121.

<sup>24</sup> Vladimir Milov (President, Institute of Energy Policy, Moscow), quoted in "The Russian Pacific Oil Pipeline: More Questions Than Answers," *The Northeast Energy Focus*, vol. 2, nr. 3 (August 2005), p. 1, available online at: [www.energypolicy.ru/eanalit.php?printversion=yes&id=1001959](http://www.energypolicy.ru/eanalit.php?printversion=yes&id=1001959).

<sup>25</sup> Zhang Guobao, cited as "China's energy tsar," in "China is Building Strategic Petroleum Reserve," *Dow Jones* (23 May 2004) in *Alexander's*, vol. 9, Nr. 12 (16 June 2004), at <http://www.gasandoil.com/goc/news/nts53364.htm>. One Chinese analyst, Yang Zing, of the Energy Research Bureau, has estimated that 90 days of petroleum reserves would be accumulated until 2015 ("China Builds Four Oil Reserve Bases," *Agence Francais Presse (AFP)*, 29 June 2004, *Ibid.* Liu Keyu of CNPC's Petroleum Economics and Information Center projected stockpile goals of 20 days supply in 2005, 50 days in 2010, and 90 days in 2020 (*VIC Site*: "Asia Pacific Daily Summary," 16 September 2002), but these amounts have not been realized.

<sup>26</sup> "Guangdong to House Oil Reserve Bases," *People's Daily* (28 February 2006) at: [http://english.people.com.cn/200602/28/eng20060228\\_246572.html](http://english.people.com.cn/200602/28/eng20060228_246572.html).

<sup>27</sup> "China's National Defense In 2002 'White Paper,'" December 9, 2002, 34, at <http://www.china-embassy.org/eng/38991.html>.

<sup>28</sup> Philip T. Reeker, U.S. Department of State press statement, September 11, 2002. Also see Richard L. Armitage, "Statement at Conclusion of China Visit," Beijing, August 26, 2002.

<sup>29</sup> Philip Bowring, "Oil-Thirsty Asia Looks to Calm Gulf Waters," *International Herald Tribune* (9 February 2006), at [http://www.iht.com/bin/print\\_ipub.php?file=/articles/2006/02/08/opinion/edbrowning.php](http://www.iht.com/bin/print_ipub.php?file=/articles/2006/02/08/opinion/edbrowning.php).

<sup>30</sup> Author's discussion with *Jiangwei III*-class frigate Commanding Officer (CO) in May 2006.

<sup>31</sup> The difficulties combating submarines in World Wars I and II remain largely unsolved; anti-submarine warfare is extremely difficult, time consuming, and resource intensive.

<sup>32</sup> PLAN Commander (Admiral Shi Yunsheng), quoted in "Jiang Made the Final Decision on Adopting Offshore Defense Strategy," *Tung Fang Jih Pao* (Hong Kong), 24 August 2001, in FBIS-CPP20010824000062.

<sup>33</sup> E-mail to author from retired U.S. ambassador who has traveled extensively in the region (05 March 2006). Also see "Pakistan, China to Ink Accord for Gwadar Port Construction," *The News* (Islamabad) 8 August 2002, in FBIS-SAP20010808000048.

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<sup>34</sup> J. Mohan Malik, "Sino-Indian Rivalry in Myanmar," *Contemporary Southeast Asia*, Vol. 16, No. 2 (September 1994), pp. 137-155, represents an extreme view of a "de facto military alliance" between China and Burma. A less alarmist view is presented by William Ashton, "Chinese Bases in Burma—Fact or Fiction?", *Jane's Intelligence Review*, Vol. 7, No. 2 (February 1995), pp. 84-87.

<sup>35</sup> "Indian Navy Exercises Seen to Irk Beijing," *Washington Times* (8 May 2000), p. 1.

<sup>36</sup> See for instance "Wang Shijie Says China Vows to Remain Active in Middle East Peace Process," *AFP* (Hong Kong), 21 November 2002, in FBIS-CPP20021121999924.

<sup>37</sup> See John H. Noer, with David Gregory, *Chokepoints: Maritime Economic Concerns in Southeast Asia* (Washington, D.C.: National Defense University Press, in cooperation with the Center for Naval Analyses, 1996), for cost estimates for various routes.

<sup>38</sup> Margaret Kriz, "Fueling the Dragon," *National Journal* (6 August 2005), p. 2512.

<sup>39</sup> Fu Chengyu, quoted in Paula Dittrick, "CNOOC Chairman Sees Steady Chinese Oil Demand," at: [http://ogj.pennet.com/articles/article\\_display.cfm?Section=ONART&C=GenIn&ARTICLE\\_ID=247605&p=7](http://ogj.pennet.com/articles/article_display.cfm?Section=ONART&C=GenIn&ARTICLE_ID=247605&p=7). Beijing's Strategic Research Centre on Oil and Gas also forecast that China would maintain a 50 percent ceiling on petroleum imports in the future ("China Will Limit Oil Imports to Less Than 50% Over Next 15 Years," *Associated Press*, in *Alexander's*, vol. 11, nr. 1 (12 January 2006).

<sup>40</sup> Xiao Fuyu, "Dependence on Oil Needs to be Cut, Says Panel," *China Daily* (13 February 2006), at <http://www.chinadaily.com.cn>. The new tax policy is discussed in Edward Cody, "Tax Shift Aims to Steer Chinese to Smaller Cars," *Washington Post* (24 March 2006), p. A12.

<sup>41</sup> "China to Increase Oil-Supply Security," *People's Daily* (Beijing), 01 January 2004), at: [http://english.people.com.cn/200401/09print20040109\\_132208.html](http://english.people.com.cn/200401/09print20040109_132208.html). Automobile efficiency standards are discussed in Keith Bradsher, "China Sets its First Fuel-Economy Rules," *New York Times* (23 September 2004), at: <http://www.nautilus.org/aesnet/2004/OCT0604/NYTimeschinafuel.doc>.

<sup>42</sup> See, for instance, "China and Vietnam Agree to Promote South China Sea Joint Exploitation," *Xinhua* (19 July 2005), in *Alexander's*, Vol. 10, Nr. 15 (17 August 2005), at <http://www.gasandoil.com/goc/news/nts53364.htm>.

<sup>43</sup> See Tai Ming Cheung, *China's Entrepreneurial Army* (Oxford: Oxford University Press, 2001); Roger Cliff, et al, *New Direction for China's Defense Industry* (Santa Monica, CA, RAND Corporation, 2005); David Shambaugh, *Modernizing China's Military* (Berkeley, CA: University of California Press, 2001); and Mark Stokes, *China's Strategic Modernization: Implications for the United States* (Honolulu: University Press of the Pacific, 2004); for the best available English-language assessments of the CMIC.