

## JMSS AWARDS OF EXCELLENCE 2010

### Second Prize

#### *The Geopolitics of Chinese Energy Security*

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One way of understanding the modern world is to view it as broken up into rival political and economic blocs that compete for resources and markets through political, economic, and military power.<sup>1</sup> Several well known scholars in the field of energy security, such as Daniel Yergin, Erica Downs, Carlos Pascual, and Ann Myers Jaffe, agree that energy policy is an integral part of a nation's external trade, foreign relations, and security policy. Today, governments of energy-consuming nations worldwide are concerned about the security of their energy needs more so than at any other time since the oil crises of the 1970s. Additionally, issues such as environmental stewardship, corporate social responsibility, sustainability, and human rights are factors in the contemporary energy debate.

According to the International Energy Agency (IEA), China produced 190 million metric tons (Mt) of oil or 4.8 percent of the world's production in 2008. Unfortunately,

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<sup>1</sup> Aad Correlje and Coby van der Linde, "Energy supply security and geopolitics: A European perspective," *Energy Policy* 34 (2006), p. 532.

the Chinese were net importers of 159 Mt of oil.<sup>2</sup> What energy policies is China adopting to bridge this gap, and what does this mean for the United States, also heavily influenced by global energy geopolitics and will Chinese policies cause conflict between these two countries? This paper will explore various aspects and inter-relationships of energy security through a geopolitical lens, beginning with a discussion of the supply and demand of crude oil, and an attempt to understand energy security. The essay will then place China in an evolving world energy matrix, examine China's relationship with the United States and the future of Chinese/U.S energy and security policy concerns, and discuss the future of Chinese energy policy and security.

### **The Current State of Energy Supply and Demand**

Yergin defines the geopolitics of energy as the effect of the location of resources on states politics.<sup>3</sup> Moreover, the influence of geographical factors, such as the distribution of centres of supply and demand, on state and non-state actions is an immediate and ongoing concern for energy-consuming nations. The world's easy-to-tap oil supplies have virtually disappeared while demand has continued to increase and will significantly increase in the coming decades. This situation has forced major energy consumers to depend on longer and seemingly more fragile supply chains to fulfill their needs. According to the IEA, "fossil fuels [will] account for 77 percent of the increase in world primary energy demand in 2007-2030, with oil demand rising from 85 mb/d [million barrels per day] in 2008 to 88 mb/d in 2015 & 105 mb/d in 2030."<sup>4</sup> The IEA, an autonomous body within the Organisation for Economic Co-operation and Development (OECD), was established in November 1974 and is recognized as one of the world's most authoritative sources for energy statistics. Its annual studies of oil, natural gas, coal, electricity, and renewables are indispensable tools for policymakers, companies involved in the energy field, and scholars. The IEA also has a plan to guard member countries against the risk of a major disruption of oil supplies, coordinate national efforts to conserve energy and develop alternative energy sources, as well as to

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<sup>2</sup> International Energy Agency, *World Energy Outlook (2009)* Paris: [www.iea.org](http://www.iea.org).

<sup>3</sup> Daniel Yergin, "Energy security in the 1990s," *Foreign Affairs*, 67, no. 1 (Fall 1988), p. 111.

<sup>4</sup> International Energy Agency, *World Energy Outlook (2009)* Paris: [www.iea.org](http://www.iea.org).

limit pollution and energy-related climate change, disseminates information on the world energy market, and seeks to promote stable international trade in energy.<sup>5</sup>

While the financial crisis of 2008-2009 halted the rise in global fossil-energy use, its long-term upward progress has resumed largely due to increased demand in developing countries like China. Sustained investment is needed mainly to combat the decline in output at existing fields, which will drop by almost two-thirds by 2030: “[T]he major industrial powers are becoming more desperate in their drive to gain control over what remains of the planet’s untapped reserves.”<sup>6</sup> According to Goldman Sachs, a financial services firm, as “mature basins such as the North Sea and the US onshore continue to decline and offer little potential for incremental growth, international oil companies (IOCs) are being required to take on additional risk in order keep returns attractive.”<sup>7</sup> Another critical concern is the replacement of reserves. The increase and replacement of the world’s reserves is an integral element of energy security and energy geopolitics.

Existing supplies are depleting at 1000 barrels per second<sup>8</sup> and due to the many risks associated with exploration, investors are wary of pouring money into finding new resources. The problem is not with the rocks where the oil is found, as advances in extraction technology, coupled with attractive oil prices, have more than offset the depletion of conventional reserves. Rather, “The problem lies in the massive economic and political risks inherent in new projects, particularly those that supply energy across national borders and thus face a multitude of political uncertainties.”<sup>9</sup> Furthermore, there has been a slump in energy investment due to the financial and economic crisis. Global upstream spending, excluding acquisitions, is budgeted to have fallen by over \$90 billion, or 19 percent, in 2009, the first such fall in a decade. However, history has shown that new reserves will be found and, in fact, oversupply will likely occur. An old axiom in the industry is that ‘there is no cure for low oil prices like low oil prices.’ If prices remain low for an extended period, exploration grinds to a halt. Therefore, as prices rise, due to the pure elasticity of world-wide supply and demand, exploration

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<sup>5</sup> International Energy Agency, *World Energy Outlook*, (2009) Paris: [www.iea.org](http://www.iea.org).

<sup>6</sup> Michael T. Klare, “The New Geopolitics of Energy,” *The Nation* (May 19, 2008), p. 2.

<sup>7</sup> Goldman Sachs, ‘*Global Energy: 280 projects to change the world*’ (January 15, 2010), p. 83.

<sup>8</sup> Based on average world oil production of 86.4 m b/d

<sup>9</sup> David G. Victor and Linda Yueh, “The New Energy Order” *Foreign Affairs* 89, no. 1; (Jan/Feb 2010), p. 61.

resumes, creating new production and reserves. However, the tipping point for both production and reserves is the level of demand.

For most of the Twentieth Century, the developed world provided the engine for oil consumption. That is no longer the case as demand has shifted in the past decade; “Non-OECD countries [will] account for 93 percent of the increase in global demand between 2007 & 2030, driven largely by China & India.”<sup>10</sup> The Asia-Pacific has become the lynch-pin for oil demand, with the “region already import[ing] 69 percent of its oil needs, or 14.88 mb/d, three-quarters of which come from the Middle East and Asia’s dependence on this volatile region is sharply increasing.”<sup>11</sup> Transportability and significant shipment costs have come to dominate the economic fragility of the supply-demand chain, resulting in a general distribution trend in which “oil supplies from the Middle East gravitate to the Asia-Pacific region, while supplies from the western hemisphere (Mexico, Venezuela, Canada and Colombia) and the Atlantic basin (the North Sea and West Africa) head towards the US market.”<sup>12</sup> Significantly, the Middle East is not the only source of supply for the Asia-Pacific region. It is likely that the Caspian Sea Region (CSR) “will emerge at some point as the world’s biggest energy-producing region...second only to the Persian Gulf in importance, and could become a major supplier of energy resources to Europe and Asia in the foreseeable future.”<sup>13</sup> China will be the major driver of this increased demand: “It is projected that by 2025, oil consumption in China could be around 10.9 million barrels per day.”<sup>14</sup> China, as a consumer, has not brought any solitude to world energy markets: “In addition to the sheer magnitude of China’s buying on these markets, the volatility of demand...and the nature in which Chinese energy companies buy and invest have made policymakers and business leaders in other parts of the world anxious.”<sup>15</sup>

The last decade has seen an extraordinary shift in expectations for the world energy system. After a long era of excess capacity, the price of oil at first rose sharply,

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<sup>10</sup> International Energy Agency, *World Energy Outlook* (2009) Paris: [www.iea.org](http://www.iea.org).

<sup>11</sup> Mamdouh G. Salameh, “Quest for Middle East oil: the US versus the Asia-Pacific region” *Energy Policy* 31 (2003), p. 1086.

<sup>12</sup> Salameh, p. 1087.

<sup>13</sup> Gregory Hall and Tiara Grant, “Russia, China, and the Energy-Security Politics of the Caspian Sea Region after the Cold War,” *Mediterranean Quarterly* 20: no.2 (2009), p. 128.

<sup>14</sup> Hall and Grant, p. 131.

<sup>15</sup> Daniel H. Rosen, and Trevor Houser, “China Energy: A Guide for the Perplexed,” *China Balance Sheet*. (Peterson Institute for International Economics May 2007), p. 28.

declined dramatically, and then rose sharply before returning to surprisingly high levels, given the continuing weakness of the global economy. It is quite likely that the supply-demand equation will remain volatile. This volatility continues to put pressure on policymakers regarding energy security and therefore warrants a discussion of the dynamics of energy security.

### **Security and Energy Security**

In order to understand how Chinese policymakers view energy security and China's place in energy geopolitics, it is important to define security and more specifically, energy security. Energy security is multi-faceted and linking 'security' with 'security of supply' is not easily quantified. Security studies theorists define security in a multitude of ways. According to Patrick Morgan, security is "physical safety from deliberate physical harm inflicted internationally, i.e., across national borders,"<sup>16</sup> while Mutiah Alagappa states that 'Security is fundamentally about people.'<sup>17</sup> Simon Dalby echoes Alagappa: "Security needs to encompass the interests of the people rather than just states, in gaining access to food, shelter, basic human rights, health care, and the environmental conditions that allow these things to be provided into the long term future."<sup>18</sup> According to former U.S. Secretary of State Condoleezza Rice, security is about state and inter-state interaction:

What has changed is...how we view the relationship between the dynamics within states and the distribution of power among them. As globalization strengthens some states, it exposes and exacerbates the failings of many others-those too weak or poorly governed to address challenges within their borders and prevent them from spilling out and destabilizing the international order.<sup>19</sup>

Others, like Rob McCrae, argue that security is more about 'insecurity' or, in other words, what a situation would be without security; basically, insecurity is equated to

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<sup>16</sup> Muthiah Alagappa, *Asian Security Practice*, (Stanford: Stanford University Press, 1998), p 28.

<sup>17</sup> Alagappa, p. 31.

<sup>18</sup> *Ibid.*, p. 28.

<sup>19</sup> Condoleezza Rice, *Foreign Affairs* 87, no.4 (Jul/Aug 2008). p. 2.

fear and the outlook for the future.<sup>20</sup> Recently, there has been an increasing emphasis on the relationship between the environment, security and the individual, which is directly and significantly impacted by oil as it is a non-renewable resource.

According to Yergin, the objective of energy security “is to assure adequate, reliable supplies of energy at reasonable prices and in ways that do not jeopardize major national values and objectives.”<sup>21</sup> Additionally, the “focus of energy security concerns is on the shocks---interruptions, disruptions”<sup>22</sup> that can occur in world markets. The concept of energy security is directly linked not only to the relations between energy demand and supply but also to an open global system. As energy is a finite global commodity, its demand and supply affects all nations, firms, households, and the environment. Broadly, energy security is the maintenance of a political order conducive to access to supplies, markets and communication, and transportation routes. The most likely threat to energy security is one of short-term disruption.<sup>23</sup> With that in mind it is important to examine the policies of large consuming nations in preparation for such eventualities of supply. Writing in 1988, Daniel Yergin’s observations are remarkably relevant today:

Oil continues to be pivotal to these concerns for two reasons. The first is that oil is still, by far, the most important source of energy for the industrial world and the one for which, in transportation there is no significant ready substitute. The second is the basic asymmetry of trade in oil--- the fact that most of the world’s proven reserves are located far from the world’s major consumers. Oil crosses borders and makes long voyages by sea. Oil, more than any other commodity, is intimately intertwined with nationalism and national power, and is subject to political and military struggles for its control.<sup>24</sup>

For these reasons, the large supplier nations, more specifically those of the Organization of Petroleum Exporting Countries (OPEC), and the large consuming nations have made adjustments to supply dynamics in an effort to alleviate economic shocks. These adjustments are the ‘security margin’ and ‘strategic petroleum reserves’ or SPRs.

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<sup>20</sup> Rob McRae and Don Hubert, eds, *Human security and the New diplomacy*, (Montreal: McGill-Queen's University Press 2001). p. 15.

<sup>21</sup> Yergin, p. 111.

<sup>22</sup> *Ibid.*, p. 112.

<sup>23</sup> Salameh, p. 1088.

<sup>24</sup> Yergin, p. 112.

According to Yergin, the 'security margin' was born out of the disruption to supply that occurred in the 1970s, "an excess of available supply and production capacity over demand that cushions shocks to the system and, not incidentally makes futile any efforts to manipulate supplies for political advantage."<sup>25</sup> Middle East crises such as the nationalization of Iranian oil (1951), the Suez crisis (1956), and the Six Day War (1967), all had relatively minor effects on the oil market. There was enough unused production capacity elsewhere in the world to make up for supplies that were not available because of military or political reasons. However, by the early 1970s, worldwide economic expansion, especially in the United States, had eliminated this spare capacity and, "when a new Middle East war sparked the Arab oil embargo in October 1973 and the first 'oil shock' there were hardly any additional alternative supplies around the world on which to call."<sup>26</sup> Oil prices increased rapidly and, by the end of the decade, the world had yet to adjust. The developed world continued to import oil at a feverish pace, while new sources of supply in Alaska, Mexico, and the North Sea had yet to be discovered. Then, political crisis put the run on oil prices again, as: "the [1979] Iranian Revolution toppled the Shah, interrupted exports, disrupted long-standing supply agreements, created panic in the oil market, drove prices to the \$34-a-barrel level and delivered the second oil shock."<sup>27</sup> The developed world took notice and made significant efforts to curb demand as energy-consuming nations developed alternative sources of energy and conservation began to have an effect. By 1988, the United States was using 27 percent less energy and 32 percent less oil per unit of GNP than it had in 1973<sup>28</sup> and conservation had become the most important 'incremental' oil source of all. However, the Americans and later the Japanese were fearful of future supply disruptions and set out to better prepare for those eventualities by creating what is known as the Strategic Petroleum Reserve or SPR.

After the 1956 Suez Crisis, President Dwight D. Eisenhower suggested that the United States should create an emergency oil reserve.<sup>29</sup> However, it was not until 1975 that Congress authorized the establishment of the SPR program, managed by the

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<sup>25</sup> Ibid., p. 114.

<sup>26</sup> Yergin, p. 114. It has been suggested that in addition to tightening supplies, some of the OPEC nations hoarded crude oil in order to disrupt markets.

<sup>27</sup> Ibid., p. 116.

<sup>28</sup> Ibid.

<sup>29</sup> Ibid.

Department of Energy (DOE), and “Today's inventory of 726.6 million barrels is the highest ever held in the SPR. Actual physical capacity is 727 million barrels.”<sup>30</sup> The U.S. SPR comprises five underground storage facilities, hollowed out from naturally occurring salt domes in Texas and Louisiana. A presidential finding that there is a “severe energy supply interruption”<sup>31</sup> allows for the drawdown of the Reserve and the DOE will only use the SPR “to ameliorate discernible physical shortages of crude oil.”<sup>32</sup> According to a March 2001 agreement, all 28 members of the IEA must have a strategic petroleum reserve equal to 90 days of the prior year's net oil imports for each respective country. Only net-exporter members of the IEA are exempt from this reserve requirement. China has recently set up an SPR to provide a short term insulation of the economy and safeguard the country's security interests from sudden disruptions in oil supply. By the end of 2008, China's SPR was to have a capacity of about 100 million barrels, and Beijing hopes to raise its SPR capacity gradually to 480 million barrels or the equivalent of three months of net import of crude oil by 2020.<sup>33</sup> Although the national utility of strategic reserves remains a question mark, the creation of an SPR is one of many initiatives China is using to better handle its seemingly unquenchable demand for oil.

### China and Energy Geopolitics

At this point, it is important to place China within the world energy dynamic, and explain the challenges China faces domestically with respect to production and reserves, and the necessity for the Chinese to look elsewhere to insure supply. China was not always a net importer of oil, from “the 1950s to the early 1970s, China was self-sufficient in energy, but its relations with other states prevented that self-sufficiency from serving the goal of economic and social development [and] by the mid 1970s, the economy was on the verge of collapse.”<sup>34</sup> China was poor in capital and technology but rich in labour. Rather than choosing a development strategy based on its natural labour

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<sup>30</sup>U.S. Department of Energy. <http://www.fossil.energy.gov/programs/reserves/spr/spr-facts.html>

<sup>31</sup>Robert Bamberger.

<sup>32</sup> Ibid.

<sup>33</sup>Chen Shaofeng and Lim Tin Seng, “CHINA'S STRATEGIC PETROLEUM RESERVES: AN UPDATE,” *EAI Background Brief No. 371*, (26 February 2008).

<sup>34</sup> Zha Daojiong, “China's Energy Security: Domestic and International Issues,” *Survival* 48, no.1 (Spring 2006). p. 183.



endowment, “Communist Party leaders ignored their comparative advantage and dragged China—kicking, screaming, and sometimes starving—in pursuit of Soviet-style industrialization.”<sup>35</sup> While Mao Zedong had used the Chinese Communist Party (CCP) to eliminate feudal landlords and capitalist classes, Deng Xiaoping used it to steer China away from a command economy and toward a free-market system. Since this economic reform began in 1978, China has achieved the second-largest national total foreign trade in the world. It has also attracted hundreds of billions of dollars of foreign investment and more than a trillion dollars of domestic nonpublic investment.<sup>36</sup> However, the road to energy self-sufficiency was bumpy and unfortunately, “traditional thinking on energy security [was] state-centric, supply-side biased, overwhelmingly focused on oil and tend[ed] to equate security with self sufficiency.”<sup>37</sup> In the late 1970s, industrial planners in Beijing hoped that doubling oil production would finance industrialization and modernization, but failure to find new oilfields precipitated economic reform between 1993 and 2002. Chinese oil demand grew close to 90 percent, while domestic production grew less than 15 percent.<sup>38</sup> China’s relatively meager reserves suggest that annual oil output has peaked<sup>39</sup> and only much higher prices and billions of dollars of capital would increase domestic production. The Chinese realized that drastic measures were necessary to quell their continued importation dilemma.

As a result, Beijing began a large-scale restructuring of the country's oil industry, merging and allocating smaller oil and petrochemical companies to create a few large integrated oil concerns.<sup>40</sup> In 1993, China became a net importer of petroleum when ten million tons of crude oil and petroleum products from abroad fed into the local economies of the coastal areas. The continual increase in imported oil led the Chinese to create a number of national oil companies in an effort to bolster the supply side of the energy equation, such as the China National Petroleum Corporation (CNPC), the China National Petrochemical Corporation (Sinopec) and the China National Offshore Oil

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<sup>35</sup> Rosen and Houser, p. 6.

<sup>36</sup> Zheng Bijian, "China's 'Peaceful Rise' to Great-Power Status," *Foreign Affairs* 84, no. 5 (2005), *Academic One File*.

<sup>37</sup> Erica S. Downs, "The Chinese Energy Security Debate," *The China Quarterly* (2004), p. 20.

<sup>38</sup> Flynt Leverett and Jeffrey Bader, "Managing -U.S. Energy Competition in the Middle East" *The Washington Quarterly* 29, no.1 (Winter 2005-6). p. 189.

<sup>39</sup>Rosen and Houser, p. 20.

<sup>40</sup> Chang, p. 226.

Corporation (CNOOC). Along with their partially privatized subsidiaries, these companies are the key drivers of China's "supply side" energy security policies and "are strong advocates of investment in overseas oilfields because it helps them to realize their twin objectives of enhancing national energy security and gaining the international experience critical to the realization of their ambitions to be competitive with the world's top oil companies."<sup>41</sup> In November 1999, CNPC formed a subsidiary called PetroChina and although it was primarily an onshore exploration and production company, PetroChina immediately ranked fifth in the world in terms of estimated reserves, and today it is the largest oil company in the world in terms of market capitalization.<sup>42</sup> PetroChina completed its initial public offering (IPO) in April 2000, and six months later, a second Chinese oil company, Sinopec, prepared its own public offering. Formally established in 1983 as the China Petroleum and Chemical Corporation, Sinopec once managed 90 percent of China's refineries. Through the Chinese oil industry's restructuring in July 1998, Sinopec acquired several production fields and about sixty regional pipeline and petrochemical companies have been folded into its portfolio since 1997, including five with shares listed on the Hong Kong stock exchange and a dozen with shares listed on mainland Chinese stock exchanges. The national oil companies and their publicly traded subsidiaries have gone along way down the road to energy efficiency, but concerns remain.

Chinese bureaucratic infrastructure in the energy sector lags other international jurisdictions. Since 1993, the country has lived without a ministerial-level agency devoted to energy-development policies, as 'Attempts have been made to create one in the past, but have failed in the face of opposition from other ministries and state energy companies.'<sup>43</sup> Furthermore, "Frequent changes to and confusion in the lines of authority in energy-development policy also creates great difficulties for foreign participation in the Chinese energy market."<sup>44</sup> Noted energy analyst Eric Downs explains further:

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<sup>41</sup> Downs, p. 23.

<sup>42</sup> <http://www.pfcenergy.com/pfc50.aspx>

<sup>43</sup> Philip Andrews-Speed and Stephen Dow and Zhiguo Gao, "The ongoing reforms to China's government and state sector: the case of the energy industry," *Journal of Contemporary China* 9, no. 23 (2000).

<sup>44</sup> Daojiong, p. 186.

Policy debates in China are different from those in the West. They are often hidden and the participants frequently do not acknowledge that differences of opinion exist. It can be difficult to obtain information about debates ongoing in China as detailed accounts normally do not appear until one side has decisively won and its victory can be safely explained. Discussions of energy security conform to the Chinese style of debate. They occur both internally and publicly. The participants tend to talk past rather than towards each other. This lack of dialogue between the stakeholders comes from the Chinese Communist practice of not directly citing and challenging the arguments of one's opponents.<sup>45</sup>

China's energy challenge is rooted in systemic conditions that go beyond the energy sector per se and "as a whole, the energy policymaking apparatus has too few people at the national level and the Energy Bureau is staffed with fewer than 100 people. The State Energy Office has even fewer (between 30 and 40) and focuses on fairly academic matters. Compare this with the United States, where 110,000 people are employed at the Department of Energy."<sup>46</sup> Bureaucracy is not the only domestic energy concern as Chinese environmental initiatives are lax.

China has largely disregarded environmental actions and "it is not surprising that China is not a leading power in the global fight to preserve the ecosystem. Chinese enterprises have little environmental consciousness, and do not possess much expertise in environmental assessment or protection."<sup>47</sup> Furthermore, rapid economic expansion has created many challenges and concerns: "Chinese industry features a heavy industrial structure and has attracted the relocation of many polluting industries. They have caused severe damage to China's environment and have made China one of the worst polluters on earth....ranking first in air and water pollution."<sup>48</sup> The Chinese leadership has promised to continuously improve the country's standard of living and therefore China has little choice but to increase energy imports so as not to slow economic growth. To do this, the Chinese need to dramatically change how they 'employ' energy. In 1996, Chinese energy consumption per unit of GDP was four times

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<sup>45</sup> Downs, p. 30.

<sup>46</sup> Rosen, p. 18.

<sup>47</sup> Wenran Jiang, 'Fuelling the Dragon: China's Rise and Its Energy and Resources Extraction in Africa' *The China Quarterly* (2009), pp. 588-9.

<sup>48</sup> Jiang, p. 588.

the world average, five times U.S. levels, and 12 times that of Japan.<sup>49</sup> China cut energy use per unit of GDP by 14.38 percent between 2006 and 2009,<sup>50</sup> and plans to continue that trend in the future.

Another issue is that China will eventually become the biggest automobile market in the world. Sinopec executives estimate that there will be 130 million cars in the country by 2030.<sup>51</sup> What impact will that have on the environment and on the world's climate? The rapidly increasing use of fossil fuel in China is already having profound impacts on global greenhouse gas emissions. The Chinese increases not only affect the environment, but also China's energy security (or insecurity).<sup>52</sup> Carbon dioxide is not the only concern. The issue is also complicated by regional politics, labour and bureaucratic challenges, as "Other air pollutants are largely unregulated. In the absence of a stronger environmental regulator, like the Environmental Protection Agency (EPA), that balance is skewed toward near-term economic growth as industry warns of a loss of competitiveness to the province next door (and therefore jobs and tax revenue) if environmental enforcement is ratcheted up."<sup>53</sup> Some changes are happening, however, as China recently established the State Energy Office (SEO). The SEO is a new energy agency, reporting directly to the Prime Minister that seeks to lower China's energy dependence, which is the ratio of energy imported versus the energy consumed, to 5 percent.<sup>54</sup>

Regardless of when China passes the United States as the world's largest emitter of CO<sub>2</sub>, it is clear that there can be no solution to climate change without China's involvement, the failures of the Kyoto Protocol and Copenhagen notwithstanding. Recently, China has been severely criticized for the failure to reach an agreement in Copenhagen. According to Nicholas Lardy of the Peterson Institute, this is a somewhat unfair assessment. He states that "I think it's easy to criticize China's policy but I think the reality is that it was known months and months in advance that China had certain

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<sup>49</sup> Kent Calder, "Asia's empty gas tank," *Foreign Affairs* 75, no. 2 (March/April 1996).

<sup>50</sup> Bloomberg Businessweek, May, 06, 2010. <http://www.businessweek.com/news/2010-05-06/china-first-quarter-energy-use-per-unit-of-gdp-rises-update2.html>

<sup>51</sup> Leverett and Bader, p. 189.

<sup>52</sup> D. Von Hippel, et al., Introduction to the Asian Energy Security project: Project organization and methodologies. *Energy Policy* (2008), doi:10.1016/j.enpol.2008.01.010

<sup>53</sup> Rosen and Houser, p. 11.

<sup>54</sup> Zweig.

goals that compatible with reaching a binding agreement.”<sup>55</sup> Furthermore, a real cause of the disconnect between China and its global neighbors is evident:

Between now and 2030, the IEA predicts that China will account for 40 percent of the growth in global annual CO2 emissions, and yet in 2030 China’s per capita emissions will still be less than Europe’s and Japan’s and only a third as much as those of the United States. As such, convincing China to agree to the same type of mandatory limits that the rich countries are bound to under the Kyoto Protocol will be extremely challenging.<sup>56</sup>

Moreover, the Kyoto Protocol has had little impact on emissions and attempts to craft a successor treaty in Copenhagen in December 2009 met huge resistance, as the massive capital needed for cleaner energy systems is simply not available in this period of economic retrenchment. Even though the industrialized G-8 group of countries has placed climate and energy issues high on its agenda nearly every year for the last decade, little has happened beyond issuing grand and often empty proclamations.

The drive by its national oil companies to internationalize operations signifies China's desire for access to foreign supplies. Furthermore, “Commercialization and internationalization will allow China's oil and gas companies to learn at an accelerated pace, through exposure to advanced exploration and production technologies, and financial risk-management techniques.”<sup>57</sup> Chinese officials have also been encouraging representatives of state-controlled companies to secure exploration and supply agreements with states that produce oil. More importantly, “[Beijing] has been courting the governments of these states aggressively, building goodwill by strengthening bilateral trade relations, awarding aid, forgiving national debt, and helping build roads, bridges, stadiums, and harbors.”<sup>58</sup> China has chosen to secure its energy needs through direct bilateral deals with producing countries, developing a multitude of relationships in Africa, Central Asia, and the Middle East as well as Canada and some of the Latin American countries. It is to some of these international relationships that this discussion will now turn.

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<sup>55</sup> Peterson, Lardy-Weisman, p. 1.

<sup>56</sup> Rosen and Houser, p. 34.

<sup>57</sup> Yergin, et al.

<sup>58</sup> David Zweig and Jianhai Bi, "China's Global Hunt for Energy," *Foreign Affairs* 84, no.5 (2005) *Academic One File* Web. 5 Feb. 2010.

*China, Energy and the Rest of the World*

In terms of its relationship with other producing nations, China is experiencing deeper and deeper integration into global energy markets and the resulting reliance on external markets may cause destabilization or could lead to opportunity. A major issue is how China's energy needs affect the international oil market as "China's demand is so great -- and likely to get much greater -- that it could affect global supplies and prices."<sup>59</sup> Chinese oil companies began to establish an international presence in 1992 and have projects throughout the world. China's drive to gain access to foreign supplies is most evident in Africa, where Beijing has established ties with many oil-producing states including Angola and the Sudan.<sup>60</sup> A similar process is under way in Central Asia,

where China and Russia cooperate under the auspices of the Shanghai Cooperation Organization (SCO) to provide arms and technical assistance to the military forces of the Central Asian 'stans'--again competing with the United States to win the loyalty of local military elites.<sup>61</sup>

Since the mid-1990s, Chinese investment abroad has quickened. According to Paul McDonald, the managing director of a Hong Kong-based oil consultancy, Beijing believes "that there are too many hostile countries around, the United States in particular, which are prone to boycott [other] countries."<sup>62</sup> Hence, "[j]oint development of overseas resources is one way of securing future [energy] supplies."<sup>63</sup> Meanwhile, Premier Wen Jiabao, in his speeches to the annual meetings of the National People's Congress, has reiterated "the goal of strengthening domestic consumption as a major source of economic growth,"<sup>64</sup> which seems like a herculean task given that for most of the first decade of the new millennium China's policy initiatives have been relatively modest and its economic growth is very dependent on rising investment expenditures and an expanding trade surplus.<sup>65</sup> The onus is, therefore, on China's NOCs to secure

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<sup>59</sup> Zweig and Bi.

<sup>60</sup> Klare, p. 5.

<sup>61</sup> Ibid.

<sup>62</sup> Felix K. Chang, "Chinese Energy and Asian Security," *Foreign Policy Research Institute* (Spring 2001), p. 240.

<sup>63</sup> Chang, p. 240.

<sup>64</sup> Nicholas R. Lardy, "China: Rebalancing Economic Growth," in *The China Balance Sheet in 2007 and Beyond*, (Center for Strategic and International Studies and the Peterson Institute for International Economics, May 2007), p. 1.

<sup>65</sup> Lardy, p. 1.

reserves and production overseas and “Chinese firms are active in the Sudan, Iran and Syria, where the IOCs fear host-country political risk or damaging negative publicity.”<sup>66</sup> In terms of political risk, Chinese firms appear less concerned than their Western IOC peers, and because, as NOCs they face lower investment hurdles, they can accept a higher risk premium.

In the past few years, China has worked hard to improve its ties with Africa, “with frequent visits by top Chinese leaders, increasing the Chinese profile in UN peacekeeping operations, launching a cooperation forum, and offering debt reduction to African states.”<sup>67</sup> In 2000, Beijing established the China-Africa Cooperation Forum (CACF) to promote trade and investment with 44 African countries. However, the CACF has not always been about investing in oil projects and providing aid. China has also sought access to Africa's abundant mineral supplies, wooing suppliers through vigorous diplomacy, offers of development assistance and low-interest loans, high-visibility cultural projects—and arms: “China is now a major supplier of basic combat gear to many of these countries and is especially known for its weapons sales to Sudan--arms that reportedly have been used by government forces in attacks on civilian communities in Darfur.”<sup>68</sup> Moreover, China has supplemented its arms sales with military-support agreements, leading to a steady buildup of Chinese instructors, advisers and technicians in African states. According to Michael Klare:

The nations involved are largely poor, so whoever controls the resources controls the one sure source of abundant wealth. This is an invitation for the monopolization of power by greedy elites who use control over military and police to suppress rivals. The result, more often than not is a wealthy strata of crony capitalists kept in power by brutal security forces and surrounded by disaffected and impoverished masses, often belonging to a different ethnic group--a recipe for unrest and insurgency. This is the situation today in the Niger Delta region of Nigeria, in Darfur and southern Sudan.<sup>69</sup>

In fact, China's less than transparent foreign policy approach is more apt to align with many of these under-developed countries.

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<sup>66</sup> Rosen and Houser, p. 31.

<sup>67</sup> Daojiong, p. 185.

<sup>68</sup> Klare, p. 5.

<sup>69</sup> Ibid., p. 6.

Angola grabbed international headlines last year when separatist rebels mounted a deadly attack on the bus carrying Togo's football team to the African Nations Cup. Unfortunately, "the decades-old dispute between the rebels and Angola's government is about oil revenues, not sport. This is a familiar story in West Africa's most prolific oil-producing provinces."<sup>70</sup> Other, more nebulous dealings between China and Angola have caught the public eye, the most notorious being a \$2 billion loan extended to Angola for infrastructure projects in 2004. Some international observers claim that the loan prompted the Angolan government to award an oil concession to Sinopec, which was coincidentally followed up in the summer of 2006 with another \$2 billion infrastructure loan.<sup>71</sup> These loans require that 70 percent of the construction work is done by Chinese companies which employ Chinese labour and also the guaranteed trade of Chinese manufactured exports.

In May 1997, the Great Wall Drilling Company, a CNPC subsidiary, finalized its first drilling contract in Sudan; the arrangement went almost unnoticed and by April 2000 "Great Wall had invested \$700 million and drilled some fifty-seven oil wells."<sup>72</sup> Currently, China receives about five percent of its oil from Sudan and has reportedly stationed 4,000 non-uniformed 'security' forces there to protect its oil interests. The most important feature of China's relationship with Africa is energy and resource extraction. Whether the Chinese presence in Africa is good or bad for African development is yet to be determined. Moreover, time, research and the gathering of data over a longer period are needed to reach comprehensive conclusions on the nature of China's engagement in Africa.

Closer to home, Chinese leaders had hoped sources of supply in Russia and Central Asia would meet the bulk of their oil and gas needs and SCO cooperation in energy has advanced in recent years. Within the SCO framework, and in energy in particular, is the largest oil exporter, Russia, and what will be the world's largest oil importer China. Recently, "In December 2009, two concrete Chinese projects that were years in the making came to fruition in Russia and Central Asia. One provides China with Russian oil, the other with Turkmen gas."<sup>73</sup> Presently, the oil pipeline ends in east

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<sup>70</sup> Rosen and Houser, p. 32.

<sup>71</sup> Ibid.

<sup>72</sup> Chang, p. 238.

<sup>73</sup> Kevin Rosner, "China Scores Again in Energy: Russia & Central Asia," *Journal of Energy Security* (Tuesday, 12 January 2010).



Siberia, 1,300 miles from the coast. Oil will be transported by train until the second section is completed in 2012. 'The 1,700 mile pipeline was completed in November facilitated in part by a \$25 billion loan-package from China. The pipeline's has a design capacity of up to 1.6 m b/d. In return China will receive Russian oil supplies over the next 20 years."<sup>74</sup> Chinese confidence in any type of resource partnership with Russia had been problematic at best. In 2003, the Chinese believed that they had assured the construction of a pipeline from eastern Siberia into China, "but by 2004 Russia appeared to be renegeing on the deal because of Japanese financial incentives to move the projected pipeline's terminal north from China to Russia's Pacific coast, opposite Japan."<sup>75</sup> Prior to the completion of this pipeline, the only country in Central Asia from which China imported oil was Kazakhstan, and the amounts were small. China cannot expect Central Asia to significantly contribute to its energy supplies, at least in the short term. However, in the event that infrastructure eventually wends its way into China, "increased use of oil and gas from Central Asia [w]ould...be helpful in altering the energy mix of China's northwestern provinces."<sup>76</sup> Cooperation currently being exhibited between Russia and China is important for the whole region.

Further to the west, China has had an ongoing relationship with Iran since the 1980s. This relationship progressed slowly, but eventually a subsidiary of PetroChina signed a series of contracts to drill or service several dozen oil and gas wells, and in August 1998 other Chinese oil companies were invited to bid on forty-three Iranian exploration projects.<sup>77</sup> A year later, Chinese shipbuilders signed contracts valued at \$400 million to build oil tankers for Iran. Furthermore, "since the 1980s, Beijing has sold Tehran a large amount of military equipment as well as dual-use technology related to the manufacture of nuclear, biological, and chemical weapons"<sup>78</sup>; in addition, Chinese engineers are reportedly working in Iranian missile fabrication plants.

China has dramatically expanded its imports of crude oil and petroleum products from Iran since the mid-1990s, "and Iran's oil minister said at the end of 2004

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[http://www.ensec.org/index.php?option=com\\_content&view=article&id=230:china-scores-again-in-energy-russia-aamp-central-asia&catid=102:issuecontent&Itemid=355](http://www.ensec.org/index.php?option=com_content&view=article&id=230:china-scores-again-in-energy-russia-aamp-central-asia&catid=102:issuecontent&Itemid=355)

<sup>74</sup> Ibid.

<sup>75</sup> Leverett and Bader, p. 193.

<sup>76</sup> Daojiong, p. 185.

<sup>77</sup> Chang, p. 237.

<sup>78</sup> Ibid.

that Tehran expected China eventually to displace Japan as the Islamic Republic's leading market for oil exports."<sup>79</sup> China has also been seeking more direct Iranian oil resources. Chinese companies have been successful in concluding a number of recent high-profile deals in Iran such that "projected Chinese investments in oil exploration and production, petro chemicals, and natural gas infrastructure in Iran could exceed \$100 billion over the next quarter-century."<sup>80</sup> For Iran, the political and strategic advantages of cultivating closer ties to China are obvious and, "As Tehran comes under increased international pressure over its nuclear activities, the support of a permanent member both of the UN Security Council and the International Atomic Energy Agency (IAEA) Board of Governors provides much needed international political cover."<sup>81</sup> Given China's history of supplying arms and sensitive military technology to Iran, Tehran expects Beijing to play such a role again. In sum, from an energy perspective, "oil and gas deals that Iran has concluded with China have a distinctly strategic quality to them; they seem intended to ensure access to an important export market and bolster a developing political relationship."<sup>82</sup>

The Middle East has been, and will continue to be, China's largest source of energy. Since the late 1990s, Beijing's policies toward the region have been closely linked to the Chinese NOCs objectives of almost exclusive access to Middle Eastern oil. China's search for oil makes it a new competitor to the United States in terms of Middle East influence and "this competition will generate multiple points of bilateral friction and damage U.S. strategic interests in the region."<sup>83</sup> China's current emphasis on the Middle East as an energy market is historically unique. Until the 1990s, Chinese foreign policy toward the region reflected other goals:

In particular, Beijing sought to obtain support for China's military modernization, as well as cash for economic development, by providing arms not only to both sides of the Iran-Iraq War (1980–1988) but also by cooperating with Israel in the 1980s to develop its F-10 fighter aircraft, selling Saudi Arabia CSS-2 intermediate-range ballistic missiles in 1988,

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<sup>79</sup> Leverett and Bader, p. 191.

<sup>80</sup> Ibid.

<sup>81</sup> Ibid., p. 194.

<sup>82</sup> Ibid., p. 195.

<sup>83</sup> Ibid., p. 188.

and engaging in discussions with Libya and Syria about the possible sale of M-9 ballistic missiles, which Washington pressured Beijing to halt.<sup>84</sup>

Since then, China's goals have changed dramatically, especially with respect to Saudi Arabia. For a short period following the September 11, 2001 attacks, the United States became a less attractive destination for Saudi investments, and China was more than willing to help recycle some of the enormous liquidity accumulated from record-high oil revenues. China recognizes Saudi Arabia's uniquely dominant role among the world's oil producers and has quickly expanded its imports of Saudi oil: "Even though Chinese refining capability was not well suited to heavier Saudi crudes, the Saudis shifted some of their lighter crudes to the Chinese market [and by] 2002 the kingdom had become China's leading foreign supplier of crude oil."<sup>85</sup> Since the early years of the twenty-first century, China has allowed the Saudis to establish themselves in a very lucrative position, supplying the Chinese textile industry with petrochemical products. A Chinese academic familiar with the textile industry observed that, dollar for dollar, the Saudis make more from their petrochemical business in China than any place else.<sup>86</sup> Overall, the Middle East now provides about 60 percent of China's oil, and according to the IEA, by 2020 as much as 80 percent of China's oil imports could come from the Middle East.

The major available supplies of oil for export are primarily concentrated in three regions—west Africa, Russia, and the Middle East—in particular, the Gulf States. Furthermore, "within the next decade, those three areas will be supplying four in every five barrels of traded oil. The unresolved question is whether those areas can indeed provide the energy security that the world needs."<sup>87</sup> It is not likely that China will stop its drive for energy resources in the Middle East, and Middle Eastern energy producers are not likely to heed U.S. exhortations to quit supplying China because of their heavy dependence on revenues from exported oil. As Chinese demand continues to grow, the Middle Eastern producers will continue to increase exports to China, at the very least on a pro-rata basis.

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<sup>84</sup> Ibid.

<sup>85</sup> Ibid., p. 191.

<sup>86</sup> Ibid., p. 191.

<sup>87</sup> John Browne, "Managing Energy Insecurity" (Speech presented at the Institute for International Economics, Washington, D.C. February 23, 2005).

*China, Energy Security and the United States*

*A point of context should be kept in mind...China is an 800 pound gorilla on the world energy stage that cannot be ignored; but there is a 1,600-pound gorilla in this room too—the United States. Instead of treating that fact defensively, US policymakers might see it as an opportunity.<sup>88</sup>*

By 2025, it is estimated that China and the U.S. will consume approximately 35 percent of the world's oil production.<sup>89</sup> In this scenario, the potential for geopolitical tension could escalate. The United States and China are the two most important national economies in the world; China is set to pass Japan and become the world's second largest economy.<sup>90</sup> How does energy security fit into the context of the relationship between the U.S. and China? Although it is not a given that China's new energy demands will be a source of serious tension with the West in the future, the consistently antagonistic Beijing-Washington relationship makes this a distinct possibility. However, if the U.S. and China cooperated, both would ensure energy security and avoid conflict. According to noted energy security expert Ann Myers Jaffe, "big consumers can best protect their interest in keeping oil supplies steady and prices predictable by joining forces to counterweigh the influence of producers rather than by trying to forge privileged relations with them."<sup>91</sup> At a crossroads in external economic relations, the United States and China can either work toward stability or destabilize the global natural resources market.

The bilateral relationship between the United States and China remains the most profound one in the world today, as "the tremendous gap between the two countries in national power and international status and the fundamental differences between their political systems and ideology have prevented the United States from viewing China as a peer."<sup>92</sup> Some Chinese analysts forecast the decline of U.S. strategic primacy and the inevitable creation of a multi-polar world. However, in the short term Washington's

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<sup>88</sup> Rosen and Houser, p. 37.

<sup>89</sup> Klare, p. 7.

<sup>90</sup> Fred C. Bergsten, *Peterson Institute for International Economics* (Testimony before the Subcommittee on Asia, the Pacific and the Global Environment, Committee on Foreign Affairs, US House of Representatives, September 10, 2009).

<sup>91</sup> Zweig and Bi.

<sup>92</sup> Wang Jisi, "China's Search for Stability with America," *Foreign Affairs* 84, no.5 (2005): *Academic One File*.

power is not likely to decline nor will its position in world affairs change.<sup>93</sup> Moreover, many Chinese military and foreign policy analysts consider “China’s growing reliance on imported oil as a vulnerability that could be exploited by the US.”<sup>94</sup> The Chinese know that they need to find common ground with the United States regarding energy. Chinese officials regard the overarching worldview of conflict as over-blown and deny that China’s hunger for oil is increasing friction with the United States, claiming that “Although oil trade plays an important role in every field, it has a limited influence in Sino-American relations.”<sup>95</sup> Competition is unavoidable, but it need not result in conflict. Most importantly, the United States and China share an interest in a stable international environment.

From a military perspective, the U.S. is destined to try and bolster its advantage, while countering conflicting moves by China and other resource competitors.<sup>96</sup> In some quarters in Washington, including the Pentagon, there is a rising fear that China could challenge U.S. military dominance in East Asia and destabilize the region. This policy is unfounded however, and in fact U.S.-China naval relations have resulted in an interesting paradox regarding oil supplies. According to Erica Downs, China must rely on the United States to guarantee the seaborne transport of its oil:

China is in the uncomfortable position of dependence on the United States, a potential adversary, for the security of its imported oil as China does not possess the military capabilities to secure the sea-lines of communication, through which the majority of its oil imports travel, and must rely on the United States to guarantee safe passage. Although it has been argued that the Chinese goal of secure oil supply lines can be more easily and cheaply satisfied by “free riding” on American protection of the communication lines than by China attempting to secure these import channels itself, not all Chinese strategists are comfortable with this situation. Chinese writings on energy security, especially those by military and foreign policy analysts who consider worst case scenarios, identify China’s growing reliance on imported oil as a vulnerability that could be

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<sup>93</sup> Ibid.

<sup>94</sup> Downs, p. 31.

<sup>95</sup> Zweig.

<sup>96</sup> Klare, p. 2.

exploited by the US. They worry that the United States and its allies could disrupt the flow of oil to China during a Sino-American conflict.<sup>97</sup>

Bernard Cole further argues that "Beijing will not be able to rely on its navy alone to protect its vital [sea-lanes], and ensure a steady supply of energy resources,"<sup>98</sup> although over the past two decades, China's access to imported oil has never been interrupted for political reasons.

Consequently, for both the US and China, their mutual economic relationship is too important for military concerns to escalate, and an insatiable demand for fossil fuels has forced mutual co-operation. However, the paradox continues. Some analysts in China argue that "U.S. military forces are overextended and under-supported logistically and financially to achieve dominance in the Asia-Pacific, Middle East and Persian Gulf, European, and Latin American theaters simultaneously."<sup>99</sup> At the same time, others including Academy of Military Sciences strategist General Wang Zhenxi, argue that extended US "global dominance will continue for the indeterminate future because existing alliances give the United States greater flexibility and strategic reach."<sup>100</sup> In point of fact, China consistently avoids the United States in its global hunt for resources. China has tended to transact in markets from which the United States is absent; thus in many areas the two countries are not really in direct competition,<sup>101</sup> but the *problematique* of diplomatic discourse between the two nations continues.

What is the likely character of the relationship between the United States and China over the next two or three decades? Will the future bring convergence toward cooperation, stability, and peace or deterioration and perhaps to war? According to Dr. Aaron Friedberg of Princeton University, "As President George W. Bush began his second term in office...there were signs of mounting friction between Washington and Beijing and increasing skepticism, on the U.S. side at least, that the relationship was as harmonious, and the interests (much less the values) of the two parties as compatible, as

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<sup>97</sup> Downs, p. 32.

<sup>98</sup> Zweig.

<sup>99</sup> David Shambaugh, "China's military views the world: Ambivalent Security," *International Security*, Vol. 24, No. 3 (Winter 1999/2000), p. 65.

<sup>100</sup> *Ibid.*, p. 65.

<sup>101</sup> Zweig.

had often been claimed.”<sup>102</sup> The current debate over China’s unwillingness to let its currency float further solidifies this position and alludes to President Obama feeling the same skepticism: “In addressing ways to increase U.S. exports, Obama deliberately chose to enter into the intense debate over China’s currency policies, as they have long been a point of contention between the two states.”<sup>103</sup> However, China’s increasing participation in international institutions may lead to shifts in policy. The more deeply embedded China becomes in the web of regional and global institutions, the more its leaders beliefs and expectations may conform to the emerging universal consensus that those institutions and organizations represent. For instance, a US emphasis at the OECD on the inclusion of China would be a dramatic economic development. From an energy perspective, subsequent membership in the IEA would greatly solidify the efforts of the two largest energy-consuming nations to better regulate energy stewardship and all the details that process entails, from the environment to human rights. The competition-inducing mechanisms of China’s growing material power and domestic political institutions will continue to exert a strong influence. However, the mutual gains from an expanding economic relationship will remain the single most important peace-inducing force at work in U.S.-China relations. The emergence of a group of Chinese “new thinkers” could also contribute to a less zero-sum, hard *realpolitik* approach to relations with the United States.<sup>104</sup> It is most likely that the two countries will trade, talk, and cooperate, but they will still regard each other with mistrust, maneuver for diplomatic advantage, and develop military capabilities with an eye toward possible future confrontation.

Many defence and political officials in the US see China's hunger for resources as a new strategic challenge.<sup>105</sup> The two nations must find workable strategies to co-exist and foster economic expansion. The Chinese must get on the same page as the developed world regarding international reporting standards, good governance, human rights, and the environment. Both countries’ leaders must adapt to rapid changes in the

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<sup>102</sup> Aaron L. Friedberg, “The future of U.S. China relations: Is conflict inevitable?” *International Security*, Vol. 30, No. 2 (Fall 2005), &.

<sup>103</sup> Editorial comment in:

[http://www.stratfor.com/analysis/20100311\\_china\\_us\\_obama\\_comments\\_chinas\\_exchange\\_rate/?utm\\_source=Snapshot&utm\\_campaign=none&utm\\_medium=email](http://www.stratfor.com/analysis/20100311_china_us_obama_comments_chinas_exchange_rate/?utm_source=Snapshot&utm_campaign=none&utm_medium=email) March 9, 2010 | 0958 GMT

<sup>104</sup> Friedberg, p. 43.

<sup>105</sup> Zweig.

global distribution of economic and political power. Both China and the US need to lessen, and ultimately reverse their dependence on imported energy and ease the geopolitical competition for foreign resources. The improved sustainability of each nation's domestic energy profile may be the most powerful lever for change in other areas and "the opportunity for a grand bargain in energy and environment exists to give policymakers in both China and the United States political cover for painful choices."<sup>106</sup>

Can cooperation be achieved? At present, the world seems to be awash in oil and this usually means stability in prices and a growth in nation states' Gross National Product (GNP). This situation bodes well, at least for the time being, for cooperation among oil importing nations. Additionally, it seems to reflect an accommodating posture among these nations going forward. Furthermore, it may be possible to stifle potential conflicts, not by force, but through markets, investment, the diversification of energy sources, and the promotion of alternative energy development.

### *China's Energy Future*

What does the future hold for Chinese energy security? China's current goal is to economically expand by seven percent annually.<sup>107</sup> For China, accomplishing this goal will be a challenge in the context of a globe more consciously aware of the environment, sustainability, and responsibility toward the individual. The task seems gargantuan when these challenges are coupled with China's autocracy and a shortage of energy bureaucracy and environmental-monitoring agencies. Greater dependence on other sources of energy, like natural gas and nuclear energy, would help it quench its thirst for coal and oil. China holds the world's third largest reserves of coal,<sup>108</sup> but coal is dirty and a significant contributor to air pollution. The more alternative sources of energy China uses to generate power, such as nuclear energy, the less it will need to import petroleum. The Chinese government must learn how to guide its various vested interests in the domestic energy market for its announced policy goals to succeed. It is fair to say that the threat of ineffective energy industry governance is probably as great

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<sup>106</sup> Rosen and Houser, p. 37.

<sup>107</sup> Chang, p. 212.

<sup>108</sup> Zweig.



as that from the international energy market. In short, runaway growth in energy consumption is posing a real threat to China's energy security. The problem is ever-growing consumption without significant improvement to energy efficiency. To address this inefficiency,

there have to be changes to China's policy instruments, the mechanisms of the Chinese energy industry, and improvement in Chinese energy governance, otherwise, China cannot hope to get out of the vicious cycle of the world energy market.<sup>109</sup>

Since almost 70 percent of China's energy comes from coal,<sup>110</sup> the increased use of clean-burning natural gas eventually needs to be China's domestic--and possibly industrial--fuel of use. Infrastructure and the vastness of China are the problem, although the new pipeline from Turkmenistan is a step in the right direction. China is also seeking to construct up to 40 nuclear power plants by 2020<sup>111</sup> and China is projected to become the world's largest producer of nuclear energy by 2050.<sup>112</sup> Again, this is an herculean task given the fact that China currently provides only 1.4 percent of its current energy needs with nuclear power. Also, this does not take into account the difficulties, including the environmental risks, public confidence, commerciality, and waste disposal, associated with nuclear power plants. Finally, renewable and alternative sources of energy will supply an increasing proportion of the total, but the current figures are small, providing only 1.1 percent of China's energy needs, projected to be approximately 3 percent in 2020.<sup>113</sup> For the moment, there is no alternative to hydrocarbons, especially oil.

Governments of energy-consuming nations worldwide are concerned about the security of their energy and where that energy will come from in the future. As China becomes the second largest oil consuming nation in the world, questions of energy security---for that matter all forms of security---are at the forefront of nation-state interaction. Furthermore, the United States and China are the two most important

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<sup>109</sup> Daojiong, p. 187.

<sup>110</sup> Tsutomu Toichi, "Energy Security in Asia and Japanese Policy" The Institute of Energy Economics, Japan, (IEEJ: July 2003), reproduced from the Asia-Pacific Review, May 2003, with permission of the publisher.

<sup>111</sup> Leverett and Bader, p. 197.

<sup>112</sup> Downs, p. 36.

<sup>113</sup> Browne.

national economies in the world and competition is unavoidable, but it need not result in conflict. Most importantly, the United States and China share an interest in a stable international environment and the improved sustainability of each nation's domestic energy profile may be the most powerful lever for change.

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