

2007
REPORT TO CONGRESS
of the
**U.S.-CHINA ECONOMIC AND
SECURITY REVIEW COMMISSION**

ONE HUNDRED TENTH CONGRESS
FIRST SESSION

NOVEMBER 2007

Printed for the use of the
U.S.-China Economic and Security Review Commission
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WASHINGTON : 2007



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The Commission was created on October 30, 2000 by the Floyd D. Spence National Defense Authorization Act for 2001 §1238, Public Law 106-398, 114 STAT. 1654A-334 (2000) (codified at 22 U.S.C. §7002 (2001), as amended by the Treasury and General Government Appropriations Act for 2002 §645 (regarding employment status of staff) & §648 (regarding changing annual report due date from March to June), Public Law No. 107-67, 115 STAT. 514 (Nov. 12, 2001); as amended by Division P of the "Consolidated Appropriations Resolution, 2003," Pub. L. No. 108-7 (Feb. 20, 2003) (regarding Commission name change, terms of Commissioners, and responsibilities of Commission); as amended by Public Law No. 109-108 (H.R. 2862) (Nov. 22, 2005) (regarding responsibilities of Commission and applicability of FACA).

The Commission's full charter <http://www.uscc.gov/about/charter.php> and Statutory Mandate <http://www.uscc.gov/about/overview.php> available via the World Wide Web.

U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION

OCTOBER 29, 2007

The Honorable Robert C. Byrd,
President Pro Tempore of the U.S. Senate, Washington, DC 20510
The Honorable Nancy Pelosi,
Speaker of the U.S. House of Representatives, Washington, DC 20510

DEAR SENATOR BYRD AND SPEAKER PELOSI:

On behalf of the U.S.-China Economic and Security Review Commission, we are pleased to transmit the Commission's 2007 End-of-Year Report to the Congress—the fifth major report presented to Congress by the Commission—pursuant to Public Law 106-398 (October 30, 2000), as amended by Public Law No. 109-108 (November 22, 2005). This report responds to the mandate for the Commission “to monitor, investigate, and report to Congress on the national security implications of the bilateral trade and economic relationship between the United States and the People's Republic of China.” In this report, the Commission reached a broad and bipartisan consensus; it approved the Report unanimously, with all 12 members voting to approve and submit it.

In accordance with our mandate, this report includes detailed treatment of our investigations of the areas identified by Congress for our examination and recommendation. These areas are:

- **PROLIFERATION PRACTICES**—The role of the People's Republic of China in the proliferation of weapons of mass destruction and other weapons (including dual-use technologies), including actions the United States might take to encourage the People's Republic of China to cease such practices
- **ECONOMIC TRANSFERS**—The qualitative and quantitative nature of the transfer of United States production activities to the People's Republic of China, including the relocation of high technology, manufacturing, and research and development facilities, the impact of such transfers on United States national security, the adequacy of United States export control laws, and the effect of such transfers on United States economic security and employment
- **ENERGY**—The effect of the large and growing economy of the People's Republic of China on world energy supplies and the role the United States can play (including joint research and development efforts and technological assistance) in influencing the energy policy of the People's Republic of China
- **UNITED STATES CAPITAL MARKETS**—The extent of access to and use of United States capital markets by the People's Republic of China, including whether or not existing disclosure and transparency rules are adequate to identify People's Republic of China companies engaged in harmful activities
- **REGIONAL ECONOMIC AND SECURITY IMPACTS**—The triangular economic and security relationship among the United States, [Taiwan], and the People's Republic of China (including the military modernization and force deployments of the People's Republic of China aimed at [Taiwan]), the national budget of the

People's Republic of China, and the fiscal strength of the People's Republic of China in relation to internal instability in the People's Republic of China and the likelihood of the externalization of problems arising from such internal instability

- **UNITED STATES-CHINA BILATERAL PROGRAMS**—Science and technology programs, the degree of non-compliance by the People's Republic of China with agreements between the United States and the People's Republic of China on prison labor imports and intellectual property rights, and United States enforcement policies with respect to such agreements
- **WORLD TRADE ORGANIZATION COMPLIANCE**—The compliance of the People's Republic of China with its accession agreement to the World Trade Organization (WTO)
- **FREEDOM OF EXPRESSION**—The implications of restrictions on speech and access to information in the People's Republic of China for its relations with the United States in the areas of economic and security policy

The Commission conducted its work through a comprehensive set of seven public hearings, taking testimony from over 118 witnesses from Congress, the executive branch, industry, academia, policy groups, and other experts. It conducted six of these hearings in Washington, D.C. and conducted one field hearing in Chapel Hill, North Carolina. For each of its hearings, the Commission produced a transcript (posted on its website—www.uscc.gov). The Commission also received a number of briefings by officials of executive branch agencies, intelligence community agencies, and the armed services, including two days of both classified and unclassified briefings at Wright-Patterson Air Force Base, Ohio by the Defense Department's and military services' research agencies on Chinese and U.S. science, technology, research, and development accomplishments and challenges. (The Commission is preparing a classified report to Congress on those topics.)

Commissioners also conducted official visits to China, Hong Kong, and Taiwan, and to India to hear and discuss Indian perspectives on China and its global and regional activities. In these visits, the Commission delegations met with U.S. diplomats, host government officials, representatives of the U.S. and foreign business communities, and local experts.

The Commission also relied substantially on the work of its excellent professional staff, and supported outside research in accordance with our mandate.

The Report includes 42 recommendations for Congressional action. Our ten most important recommendations appear on page 15 at the conclusion of the Executive Summary.

We offer this Report to Congress in the hope that it will be useful as an updated baseline for assessing progress and challenges in U.S.-China relations.

Yours truly,

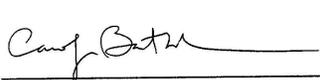


Carolyn Bartholomew
Chairman



Daniel Blumenthal
Vice Chairman

Commissioners Approving the Report



Carolyn Bartholomew, Chairman



Daniel Blumenthal, Vice Chairman



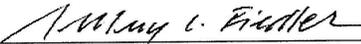
Peter T. R. Brookes, Commissioner



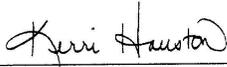
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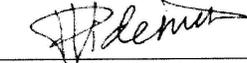
Kerri Houston, Commissioner



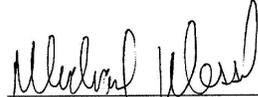
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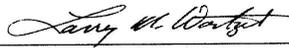
Dennis C. Shea, Commissioner



Peter Videnieks, Commissioner



Michael R. Wessel, Commissioner



Larry M. Wortzel, Commissioner

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EXECUTIVE SUMMARY

This Report sets forth the Commission's analysis of the U.S.-China relationship in the topical areas designated by the Commission's Congressional mandate; these are the areas the Commission is to consider, and about which it is to make recommendations to the Congress. These include China's proliferation practices; the qualitative and quantitative nature of economic transfers of United States production activities to China; the effect of China's development on world energy supplies; the access to and use of U.S. capital markets by China; China's regional economic and security impacts; U.S.-China bilateral programs and agreements; China's compliance with its accession agreement to the World Trade Organization; and the implications of China's restrictions on freedom of expression. Our analysis, along with recommendations to the Congress for addressing identified concerns, is chronicled in the Report and summarized herein.

COMMISSION ASSESSMENT OF U.S.-CHINA ECONOMIC AND SECURITY RELATIONS

Congress gave the Commission the mission of evaluating "the national security implications of the bilateral trade and economic relationship between the United States and the People's Republic of China," and reporting its evaluation to Congress annually together with its findings concerning the topical areas listed above. The Commission adopts a broad interpretation of "national security" in making its review and its evaluation of how the U.S.-China relationship affects the economic health and industrial base of the United States, the military and proliferation risks China poses to the United States, and China's threat to U.S. economic and security interests and influence in Asia.

In its four previous major reports to Congress, the Commission outlined several trends in the economic and security relationship between the United States and China. The Commission's assessment for 2007 is consistent with those past analyses. This year the Commission has focused on identifying the specific commitments that China has made and laws that its government consequently has promulgated, while evaluating the extent to which China has fulfilled or failed to fulfill those commitments.

COMMISSION CONCLUSIONS

This Report presents its conclusions, analyses, and recommendations to Congress in 15 segments organized in five chapters in response to the requirements of the Commission's Congressional mandate. However, the Commission has attempted to take an integrated approach to its assessments, believing that economic, security, and other issues are interrelated. The intersections of U.S. geopolitical, economic, security, diplomatic, and cultural interests

form a complex web of concerns that comprise the overall relationship between the United States of America and the People's Republic of China.

The Commission's conclusions are included in this Executive Summary. At the end of this Summary, the Commission's ten key recommendations are listed. The Commission makes a total of 42 recommendations to the Congress in this Report. Those pertaining to each of the five Report chapters appear at the conclusion of the chapter, and a comprehensive list is provided beginning on page 285.

The United States-China Trade and Economic Relationship

China made progress toward economic reforms in 2007, but only with great hesitancy and, even then, only with the prodding of other nations and the World Trade Organization. China is unwilling to embrace market-oriented mechanisms, such as a freely traded currency, because it maintains a preference for authoritarian controls over its economy. It has not yet, for example, allowed its citizens to freely invest their savings abroad or even in Hong Kong's stock market. Yet China also avoids effective controls where it fears that government intervention might limit economic growth. China continues to refuse, despite repeated promises, to crack down effectively on trademark and copyright piracy of foreign goods sold within China. The central government also has repeatedly resisted calls for it to rein in the extensive government subsidies it provides to favored industries, also a violation of free-market principles. Worse still, China formally has adopted a policy of retaining large amounts of the economy—encompassing a dozen industries from information technology and telecommunications to shipping and civil aviation—under direct government ownership and control. As China has adopted and maintained policies designed to support an export-driven growth model, it has amassed the world's largest foreign currency reserves of \$1.43 trillion.

Conclusions

The Relationship's Current Status and Significant Changes During 2007

- China's trade surplus with the United States is growing dramatically, due in large part to its financial and economic policies that stimulate exports and discourage imports. China's trade surplus with the United States in goods through August 2007 rose to \$163.8 billion, an increase of 14 percent over the \$143.3 billion surplus during the equivalent period in 2006. By mid-2007, China had accumulated \$1.43 trillion in foreign currency reserves, up from \$1.2 trillion in 2006. An estimated 70 percent of those reserves, or about \$1 trillion, are invested in dollar denominated assets, mostly U.S. government and corporate bonds.
- Following a five-year phase-in period, China is largely complying with the World Trade Organization's procedures, rules, and regulations, at least on paper. While China has rewritten thousands of laws and regulations, major improvements are still needed in implementation and enforcement. China's performance is notably

weak in the areas of intellectual property protection, maintenance of a market-based currency regime, and compliance with the WTO's prohibitions on export subsidies.

- China's economy remains heavily dependent on manufactured exports to sustain its rapid economic growth and to provide jobs for a rural population moving to urban areas in search of higher pay and benefits. Chinese authorities have not been willing to alter this pattern, even if pushing exports means violating WTO rules or free market principles.
- China's trade relationship with the United States is severely out of balance, with its exports to the United States exceeding its imports by a ratio of more than five to one.
- Beijing has been slow to translate three decades of record economic growth into a better life for all its citizens by enhancing government programs for education, pensions, and health care. Nor has China encouraged financial services reform to allow its citizens to enjoy the benefits of consumer credit and affordable insurance. As a result, Chinese workers save much of their income to enable them to contend with life's vicissitudes and they purchase few imported goods.
- The artificially low value of the renminbi provides a subsidy for Chinese exporters and serves as a hindrance to Chinese importers and consumers.
- China's mercantilist policies are taking a huge toll on small and medium-sized manufacturing facilities and their workers in the United States. While U.S.-based multinationals can transfer and have transferred much of their production to China to serve that market, small and medium-sized manufacturers in the United States are not as mobile. They face the full brunt of China's unfair trade practices, including currency manipulation and illegal subsidies for Chinese exports. This is significant because small and medium enterprises (SMEs) represent 60 percent of the manufacturing jobs in America.

The Control of China's Economy by its Government, and the Effect on the United States

- The push for reform in China's economy in the 1980s and 1990s appears in some cases to have reversed with a renewed use of industrial policies combined with a new class of super state-owned enterprises.
- China's 11th Five-Year Plan emphasizes industrial policy planning for the state-owned sector. The plan heavily promotes the development of value-added industries of a technical nature. The Chinese Communist Party employs a range of tools to accomplish these goals, including the use of subsidies and state-funded R&D centers, promoting foreign direct investment from Western high-tech firms, employing strategies to maximize technology transfers from more-developed economies, infant-industry protection, and directed use of China's state-owned enterprises.

- China's state-owned sector is evolving in a way that challenges American firms. The Chinese government provides state-owned enterprises a combination of subsidies, access to cheap capital, industrial coordination, and foreign policy support that U.S. firms do not have.
- China's consolidation of its state-owned enterprises (SOEs) is guided by a new policy announced in December 2006. The State-Owned Assets Supervision and Administration Commission (SASAC) and China's State Council identified seven strategic industries in which the state must maintain "absolute control through state-owned enterprises," and five heavyweight industries in which the state will remain heavily involved. The strategic industries are armaments, power generation and distribution, oil and petrochemicals, telecommunications, coal, civil aviation, and shipping. The heavyweights are machinery; automobiles; information technology; construction; and iron, steel, and non-ferrous metals. It is estimated that forty to fifty of SASAC's 155 central SOEs fall in the strategic category and account for 75 percent of SASAC's total assets.
- China has created a new institution to invest part of its \$1.43 trillion foreign exchange holdings. The new sovereign wealth fund, managed by the China Investment Corporation (CIC), initially has been allotted \$200 billion to invest, according to some estimates. It is expected that the fund will diversify by exchanging some investments in American debt securities for investments in international equity markets. Recently the CIC purchased a \$3 billion stake in the private equity firm The Blackstone Group.
- China's economic policies violate the spirit and the letter of World Trade Organization membership requirements. The United States is not limited to countering China's industrial policy tactics through the WTO, however. It can use other WTO-sanctioned trade remedies to protect itself, such as Countervailing Duties (CVDs) and antidumping cases.

The Impact of Trade with China on the U.S. Defense Industrial Base

- As the globalization of supply chains continues, elements of the U.S. defense industrial base are being moved overseas, thus lengthening the supply chains of U.S. weapons and defense equipment. U.S. defense contractors have merged and moved some manufacturing outside the United States. Sources of defense components are becoming scarcer in the United States, and the supply of American workers skilled in manufacturing these components is diminishing.
- The U.S. Department of Defense is not a sufficiently large customer to many of its suppliers to be able to influence their supply chain decisions.
- Some of the items DoD purchases contain foreign-made components, the origin of which, in most cases, is unknown. There po-

tentially are substantial security risks to the United States from using foreign-made parts and components in weapon systems or other equipment important to U.S. defense. These can result from—

- tampering with or specially engineering foreign-manufactured parts and components.
- inadequate quality that leads to failure or substandard performance.
- interruption of the supply chains, thus depriving U.S. forces of the weapons and equipment on which they depend to defend U.S. interests.
- At the present time, U.S. officials are neither carefully tracking the persistent attrition of the U.S. defense industrial base as more and more manufacturing is outsourced offshore, nor identifying and justifying on national security grounds an irreducible minimum defense industrial base that the United States should retain regardless of the cost or effort required to do so.
- Specifically with respect to the impact of trade with China on the U.S. defense industrial base, U.S. officials are neither—
 - methodically tracking what parts and components are obtained from China that are used in significant and/or unique systems important to the nation’s defense; nor
 - identifying based on specific national security considerations (1) particular parts and components that, if obtained from China, contractors and subcontractors should be prohibited from using in any such systems, and (2) a subset of key defense systems in which contractors and subcontractors are or should be prohibited from using any parts or components from China; nor
 - developing effective means to implement, monitor adherence to, and enforce such policies and restrictions.
- The United States currently is a world leader in R&D, which greatly benefits its defense industrial base. As the quality of R&D in China continues to improve, and China’s research capabilities continue to expand, it is becoming an increasingly attractive destination for American companies to outsource their R&D.

A Case Study of the Local Impact of Trade with China: North Carolina

- The accelerating decline in North Carolina’s manufacturing employment is due in large measure to increasing competition from imports, mostly from China. Manufacturing employment in the United States has declined for 50 years although the dollar value of manufacturing production has increased as a result of rising productivity.
- During this same period, the number and proportion of jobs in the North Carolina services sector have been increasing. This shift has put downward pressure on wages because manufacturing historically has paid substantially higher wages than the services sector. This shift also has reduced the number of work-

ers receiving such fringe benefits as retirement and health insurance, in part because some of the displaced workers were able to find only part-time jobs that often do not offer benefits.

- Because a greater proportion of North Carolina’s workforce held manufacturing employment than held such employment in any other state, North Carolina’s workforce was more vulnerable to competition from imports than the workforces of other states. North Carolina’s manufacturing economy was made even more vulnerable by its concentration in the import-sensitive sectors of textiles, apparel, and furniture.
- Trade agreements can profoundly affect state and regional economies and particular industries. The combination of China’s 2001 admission to the World Trade Organization (WTO), which gave it quota-free access to U.S. markets for its textile and clothing exports, and the subsequent U.S. grant of Most Favored [Trading] Nation status that lowered most tariffs on Chinese imports, battered North Carolina’s textile and apparel industries, and they never recovered. While trade agreements that lower import barriers among America’s trading partners have the potential to benefit American exporters, North Carolina appears to have realized few if any substantial benefits from China’s admission to the WTO, and the net effect of trade with China since its accession appears to be negative overall for North Carolina’s economy.
- Two provisions in trade laws and agreements proved crucial to sustaining what remained of North Carolina’s textile, apparel, and furniture industries after China’s admission to the World Trade Organization. The first authorized the U.S. Department of Commerce to levy “dumping” duties on below-cost imports of Chinese wooden bedroom furniture in July 2004. The second authorized imposition in 2005 of temporary import quotas on Chinese clothing imports.
- North Carolina has been a global leader in establishing a local base for research and science, leveraging the state’s best universities and an innovative industrial policy to fashion the 700-acre Research Triangle Park, now almost 50 years old. It has been successful by almost any measure, attracting 157 tenants and producing its own job-creating momentum. This center has enabled North Carolina to compete successfully for facilities of many companies and has substantially increased the number of higher paying jobs in the state.
- North Carolina has worked diligently to make user friendly the system of benefits for dislocated workers that has been established and funded largely by the Federal Government. This has greatly benefited its workers who have been dislocated by the effects of trade, and has helped salvage the state’s economy and place it on a firmer footing.

China’s Security-Related Activities

The pace and success of China’s military modernization continue to exceed U.S. government estimates. Indeed, on occasion the U.S. defense and intelligence communities have been taken by surprise,

as in the case of the launching of the Jin class submarine by the navy of the People's Liberation Army. China's defense industry is producing new generations of weapon platforms with impressive speed and quality, and these advancements are due in part to the highly effective manner in which Chinese defense companies are integrating commercial technologies into military systems. Additionally, industrial espionage provides Chinese companies an added source of new technology without the necessity of investing time or money to perform research. Chinese espionage in the United States, which now comprises the single greatest threat to U.S. technology, is straining the U.S. counterintelligence establishment. This illicit activity significantly contributes to China's military modernization and acquisition of new capabilities.

Since the 1990s, China's nonproliferation record has improved. However, the United States continues to have concerns about China's willingness to invest in, sell weapons and military equipment to, and offer diplomatic support to regimes such as Iran's that are suspected of developing nuclear weapons, and regimes such as Sudan's that perpetuate human rights abuses. Additional commitment and political will in the Chinese government is needed to strengthen China's enforcement of its export controls, especially to ensure that state-controlled companies and private entities in China do not proliferate outside government policy and regulation.

Conclusions

China's Military Modernization

- Several Chinese advances have surprised U.S. defense and intelligence officials, and raised questions about the quality of our assessments of China's military capabilities.
- Chinese military strategists have embraced disruptive warfare techniques, including the use of cyber attacks, and incorporated them in China's military doctrine. Such attacks, if carried out strategically on a large scale, could have catastrophic effects on the target country's critical infrastructure.
- China has developed an advanced anti-satellite program consisting of an array of weapons that could destroy, damage, or temporarily incapacitate an adversary's satellites. The use of high energy lasers to temporarily blind U.S. satellites in late 2006 and the use of a direct-ascent anti-satellite kinetic weapon to destroy an aging Chinese satellite in early 2007 demonstrate that China now has this capacity.
- The Chinese defense industry, while still lagging far behind that of the United States, has begun achieving noteworthy progress over the past ten years. New generations of warships, fighter aircraft, spacecraft, submarines, missiles, and other sophisticated weapon platforms are coming off production lines at an impressive pace and with impressive quality.
- The pace at which each of China's defense industrial sectors is modernizing varies in direct proportion to its degree of integration in the globalized production and R&D chains, because such

integration provides access to the most up-to-date technologies and manufacturing expertise.

- China is supplementing the technologies that its defense industry obtains through commercial transfers and direct production partnerships with an aggressive and large-scale industrial espionage campaign. Chinese espionage activities in the United States are so extensive that they comprise the single greatest risk to the security of American technologies.

China's Proliferation

- Since the 1990s, China's nonproliferation record has improved, especially after it established and expanded the reach of its domestic export control system. However, serious concerns remain about the continued transfer of weapons and technology to nations of concern and nonstate actors by Chinese state-controlled and private companies.
- Because of the opacity of China's government, when incidents of proliferation occur, it generally is difficult or impossible to know whether (1) the government objects to the incidents but is either unaware of them or powerless to stop them; (2) the transactions result from government acquiescence fostered by entrenched corruption; or (3) the government approves of the transactions in direct contravention of its official policy and commitments. Regardless, there is evidence that many illicit transactions are not accidental, and that all three of these explanations may have some validity in various cases.
- It is vital for U.S. national security that China ensure it is not the source of proliferation that is contrary to its commitments, and it is equally vital for other nations committed to nonproliferation to monitor China's adherence to its commitments and insist that China honor them.
- If China wants to be perceived as a responsible stakeholder, it must stop providing trade and diplomatic cover to countries such as North Korea and Iran that are under international pressure to end their WMD programs.
- Continued United States cooperation with China, and U.S. technical assistance to China, on export controls, border security, customs procedures, and port and shipping security can contribute significantly to China's capacity to play a positive role in reducing proliferation and consequently to increasing the world's security from terrorism and the destructive acts of irresponsible states.
- In order for China to eliminate its proliferating activity, it must couple sufficient technical capacity with strong and unmistakable political commitment, and ensure that its government, its military, and its state-controlled companies and other organizations adhere to both the letter and the spirit of China's multilateral and bilateral nonproliferation commitments.

China's Science and Technology Activities and Accomplishments

- China's Fifteen-Year Plan for science and technology incorporates elements of previous similar plans, but also takes into account important social factors such as needed institutional and cultural reforms. It also places new emphasis on the importance of indigenous innovation rather than reliance on imported high-tech products.
- China no longer seeks only to attain parity with Western science and technology, but instead is working to surpass the technological prowess of the West.
- On the whole, Chinese science and technology capabilities still are not world-class. In some key specialties such as nanotechnology, however, Chinese scientists and engineers are among the world's most advanced.
- Chinese policies promote "leapfrogging," whereby the development of Chinese technologies improves on established foreign technologies and bypasses intermediate domestic R&D steps. This speeds product development and saves China the time and cost of accomplishing the intermediate steps. Industrial espionage contributes to this process.
- A major objective of Chinese science and technology policy is to acquire technology that will strengthen the PLA while it also realizes commercial benefits.

China's Energy and Environmental Policies and Activities

China's rapid pace of development has led to increasing energy consumption that has global environmental and energy security effects. China's demand for oil and reliance on oil imports are growing, but it has maintained an overall dependence on coal as a leading energy resource, especially for production of electricity. Dependence on coal, a lack of energy efficiency, and poor enforcement of energy and environmental regulations are creating devastating environmental effects that extend throughout the region and beyond to the United States. Additionally, China's strategy for acquiring energy resources has created concern that China is not willing to act as a responsible player in the international energy market, where it continues to invest in countries whose governments perpetuate conflict and human rights abuses such as Sudan, Iran, and Burma. China's actions in this regard affect U.S. national security interests in the Middle East and Asia.

United States-China cooperation on energy and energy-related environmental concerns occurs on several different levels in both the private and public realm, and has produced new opportunities for the development and application of clean energy technology to address China's energy and environmental situation.

Conclusions

China's Energy Policy, Demand, and Supply

- The lack of policy coordination and implementation between the central government and local or provincial levels of government is hindering China from achieving greater gains in energy efficiency, promoting greater use of alternative fuels, and mitigating the environmental consequences that result from China's dependence on coal. If this structure is not reformed, the Chinese government will not have, for the foreseeable future, the administrative tools necessary to reform China's domestic energy consumption patterns, and also will be limited in its ability to address global energy problems proactively.
- As incomes rise in China and the economy becomes more consumption-oriented, effective conservation programs will be essential if energy demand growth is to be limited. China will have to pay close attention to mitigating the effects of energy-intensive and heavily polluting consumer items such as automobiles and air conditioners, which will require government regulation or market-based incentives that influence consumer choices on such items. Changing consumer demand also will affect the composition of China's fuel needs, likely increasing China's use of oil and natural gas, which will increase global demand for both.
- China is pursuing an energy diversification strategy that seeks to find cleaner alternatives to coal. However, as long as the environmental costs of burning coal are not built into coal's price, the degree of diversification into natural gas, nuclear power, and renewable energy sources will have little impact on the complexion of the fuel supply, and China will continue to rely on coal as its primary energy source and increase its reliance on oil. This has long-term negative environmental and strategic consequences for the United States, but also raises opportunities for U.S.-China collaboration on clean coal technologies.

China's Environmental Situation

- China's national leaders recognize that a failure to enforce environmental controls on pollution has significant economic and social costs. However, the government has not yet taken steps to ascribe value to environmental compliance that equals or exceeds the value placed on economic growth. Continued lax enforcement may have consequences for the sustainability of China's economic growth.
- If China's underlying environmental problems are not addressed effectively, this could become another source of unrest that could challenge the Chinese Communist Party's control of the country.
- China soon will overtake the United States as the largest emitter of greenhouse gases in the world if it has not already done so. China currently is the largest national source of coal mine methane and is poised to become the largest national source of carbon

dioxide. Global climate change initiatives will not work without China's participation.

- The effects of China's energy-related pollution are far-reaching, extending to the United States and beyond. China lacks adequate data and public information to assess accurately changes in its energy consumption and resulting environmental consequences, especially at the provincial and local levels. Greater availability and transparency of data can improve the central government's ability to make and implement sound energy policy, and assist the United States in understanding more clearly the mutual energy and environmental challenges facing both countries. Additionally, more accurate data can facilitate deployment of green energy technology, much of which is developed in the United States.

The Geostrategic Impact of China's Energy Policies and Activities

- China's pursuit of equity oil acquisitions is contrary to international commercial practices related to energy that support use of the market, and allocation of available petroleum supplies through international cooperation in the event of an emergency.
- In pursuing some of its global energy interests, China aids regimes operating contrary to U.S. foreign policy interests, such as the genocidal government in Sudan and Iran's government that is attempting to develop its own nuclear capability.
- The bilateral relationships China is building around the world—many if not most of them largely motivated by its quest for energy supplies and other resources—have resulted in an increase of its global economic, political, diplomatic, and cultural influence that has the potential to challenge U.S. interests.
- China's naval modernization is targeted not only on a Taiwan scenario but also on protecting China's economic resource supply chains. As Chinese overseas investment grows, the government will have a greater stake in protecting these investments and the ability to transport to China the resources the investments are producing and its economy requires. This is a major determinant of China's naval modernization.

Prospects for Addressing the Effects of China's Energy Consumption

- Success in addressing China's energy challenges will require the Chinese government to focus on correcting the structural weaknesses within its energy policymaking apparatus.
- Cooperative projects that promote and support the collection and reporting of sufficiently detailed energy and environmental data will contribute substantially to China's ability to address challenges in these fields and to the ability of the United States and other nations to provide real encouragement and targeted assistance to those efforts.

- U.S.-China cooperation on energy and the environment is a crucial component for addressing the energy challenges that both countries face.
- China presents an opportunity to develop and apply U.S. energy technologies on a large commercial scale that will increase the viability of these technologies on the market.

China in Asia

During 2007, Commission delegations conducted fact-finding visits to China, Hong Kong, Taiwan, and India in fulfillment of the Commission's Congressional mandate to assess the U.S.-China relationship, the triangular U.S.-China-Taiwan relationship, and China's regional economic and security impacts. The U.S. commitment to the 1979 Taiwan Relations Act remains strong. American leaders are committed to helping Taiwan's people maintain international visibility, continue to upgrade their self-defense capabilities, and further strengthen their democracy. Politically, Taiwan's relationship with the PRC remains tense, with leaders on both sides of the Taiwan Strait relying on rhetoric to advance their respective positions vis-à-vis the status of Taiwan.

In Hong Kong, the transition to a government elected by universal suffrage has yet to occur, although this is guaranteed in Hong Kong's Basic Law that establishes the political system for the Hong Kong Special Administrative Region. Hong Kong's Chief Executive, Donald Tsang, has promised to resolve the question of universal suffrage before the end of his term in 2012, but democracy supporters are skeptical that any real progress toward an equal and universal right-to-vote will occur in the near future.

While India and China have grown to become Asia's leading emerging economies, India has become both a competitor and a partner with China in Asia. The unresolved border conflict between India and China could act as a destabilizing factor in the region, and so far, negotiations to resolve this conflict remain stalled. U.S.-India economic and security cooperation possibly could serve as a counterweight to growing Chinese influence in Asia.

Conclusions

Taiwan

- Taiwan's 2008 Presidential and legislative elections raise a number of significant issues in cross-Strait and U.S.-Taiwan relations.
- Tensions between Taiwan and China have created an emotionally-charged stand-off that risks armed conflict if not carefully managed by both sides. Such a conflict could involve the United States.
- Economic links between Taiwan and China have grown significantly over the last several decades. Currently, it is estimated that Taiwan businesses have between US\$150 billion and US\$250 billion invested in the PRC, accounting for one-tenth of

China's total foreign direct investment and making Taiwan China's largest investor. Some think these economic links act as a stabilizing force, while others are concerned that they strengthen China's military-industrial complex to the potential detriment of Taiwan.

- Although Taiwan's defense spending has declined as a percentage of GDP, it has continued to enhance its self-defense capabilities in meaningful ways. The United States has been encouraging Taiwan to enhance its ability to engage in joint and combined operations, and to expand and improve its command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) abilities, naval operations, and missile defense. Taiwan has made notable progress in some of these areas.
- Partisan politics in Taiwan have prevented the achievement of a consensus concerning which steps it needs to take and what weapon systems it needs to acquire to give it optimum defensive capability. This weakens its ability to deter Chinese aggression.
- Taiwan desires to establish a Free Trade Agreement (FTA) with the United States. It sees such an agreement as offering not only economic benefits but also diplomatic leverage it believes will be crucial to preventing the PRC from further isolating the island. For a number of reasons, the Administration has indicated it currently is unable to move forward on an FTA with Taiwan.

India

- The United States and India share similar concerns about the rise of China, the spread of its influence in Asia and elsewhere around the world, and the security implications of an emboldened China willing to assert its military power in areas outside its borders and territorial waters.
- Although India does not want to be perceived as "ganging up" against China, it will seek to expand its multilateral relationships to hedge against China's growing influence and military strength. In part because of this, opportunities exist for U.S.-India cooperation on economic and security matters and in the promotion of democratic values and governance throughout Asia.

Hong Kong

- The United States and other democracies, especially in Asia, have a strong interest in the development of democratic freedoms in Hong Kong. Progress toward universal suffrage not only is guaranteed by the Basic Law, but is an important indicator of Beijing's willingness to fully implement its "one country, two systems" principle. The delay in implementing universal suffrage, and the possibility that the definition of universal suffrage will be altered to include options other than "one person, one vote," lead to significant concerns that Hong Kong will not achieve the universal suffrage guaranteed in its Basic Law.

- The March 2007 elections for Chief Executive set an important precedent for holding public debates, articulation by candidates of policy positions and goals, and the desire of the people of Hong Kong to have multiple candidates.
- The linkages between China's energy consumption and the pollution affecting Hong Kong provide both incentives and opportunities for increasing investments in clean energy production on the mainland. This can provide an opening for American firms offering clean energy technologies.
- Maintaining an independent, free press in Hong Kong and preventing the causes of self-censorship are necessary for democracy in Hong Kong.

China's Media and Information Controls—The Impact in China and the United States

The Chinese government's policies on information control have grown more rigid since Beijing's adoption of President Hu Jintao's "Harmonious Society" socio-economic policy, which intends to mitigate sources of internal domestic conflict and criticism of the government and maintain the Communist Party's hold on power. Directed by China's Central Propaganda Department, a variety of other government agencies collectively censors domestic media sources and information that Chinese citizens can access on the Internet. Using sophisticated technologies, stiff penalties for dissent, and incentives for those who "play by the rules," Chinese authorities have created one of the most effective information control regimes in the world.

China uses its controls to manage and manipulate the perceptions of the Chinese people, often promoting nationalism and xenophobia. Additionally, Beijing uses these controls to influence the way it is perceived by foreign populations such as in the United States. By manipulating international media reports written about China and denying pertinent information to the outside world on salient issues including food and product safety and the outbreak of diseases, China's actions have the potential to endanger the welfare of U.S. citizens.

Conclusions

- Over the decades China has built one of the world's most effective information control systems. The Chinese government controls the content of newspapers, magazines, television, radio, and the Internet. Chinese journalists have been demoted, fired, imprisoned, and beaten for violating restrictions on media content. Internet users face similar restrictions and violators may be imprisoned.
- China censors information and communications pertaining to some broad issues like democracy, human rights, and the Falun Gong as well as to more subtle issues related to domestic current affairs and political developments. Strict penalties for addressing forbidden topics, and the uncertainties of where the fine lines fall at any moment, have created an environment of strict self-cen-

sorship among Chinese journalists. These self-imposed restrictions effectively stifle information Beijing deems undesirable.

- China’s information controls are designed to perpetuate the existence of the Chinese political structure and the Chinese Communist Party’s control of the nation, and also to maintain a stable environment for China’s new “rising power class,” the primary beneficiaries of the developing two-tiered society who are seeking to maintain their favored status.
- Through its media control regime, the Chinese government has been able to manipulate and influence the perspectives of many Chinese citizens. While the majority of the Chinese people understand that the information provided by Chinese state-owned media organizations may not be free of censorship and propaganda, they have little choice but to rely on it when forming their opinions about the outside world. Beijing has used this capacity to create deep feelings of nationalism inside China and can use it to incite strong anti-foreigner sentiments among the Chinese people when it wishes to do so.
- The strong nationalism Beijing has fostered may constrain its options to respond to international incidents. This could result in exacerbating tensions in a sensitive situation and turning a misunderstanding into a conflict. The media organizations supervised by the U.S. Broadcasting Board of Governors struggle in the face of Chinese censorship to provide accurate news and information to the people of China through radio and television broadcasts and the Internet. In violation of international laws the Chinese government successfully jams or blocks access to many of these broadcasts and Internet messages and content.
- Some U.S. technology firms have cooperated with and contributed to the Chinese government’s censorship and propaganda systems by supplying hardware and software. In some but not all these cases, their cooperation may be a Chinese legal requirement.
- Chinese leaders are seeking an international reputation that is benign if not benevolent, and are using every available state resource in their effort. Chinese Communist Party news outlets such as *Xinhua* are employed in a concerted perception management campaign that is directed not only at domestic audiences but also at foreign populations.
- China’s control and manipulation of information make it difficult or impossible for officials responsible for food and product safety in the United States and other nations to identify potential safety problems in Chinese imports on a timely basis and intervene to protect the health and safety of consumers.

THE COMMISSION’S KEY RECOMMENDATIONS

The Commission believes that 10 of its 42 recommendations to Congress are of particular significance. These are presented below in the order in which they appear in the Report. The complete list of 42 recommendations appears at the Report’s conclusion on page 285.

- **Treating currency manipulation as an illegal export subsidy:** The Commission recommends that Congress enact legislation to define currency manipulation as an illegal export subsidy and allow the subsidy to be taken into account when determining penalty tariffs. In addition, Congress should amend the law to allow currency manipulation to be added to other prohibited subsidies when calculating antidumping and countervailing duty penalties.
- **Determining the country of origin of U.S. weapon systems components:** The Commission recommends that Congress require the U.S. Department of Defense to prepare a complete list of the country of origin of each component in every U.S. weapon system to the bottom tier.
- **Ensuring adequate support for U.S. export control enforcement and counterintelligence efforts:** In order to slow or stop the outflow of protected U.S. technologies and manufacturing expertise to China, the Commission recommends that Congress assess the adequacy of and, if needed, provide additional funding for U.S. export control enforcement and counterintelligence efforts, specifically those tasked with detecting and preventing illicit technology transfers to China and Chinese state-sponsored industrial espionage operations.
- **Ensuring adequate support for protecting critical American computer networks and data:** The Commission recommends that Congress assess the adequacy of and, if needed, provide additional funding for military, intelligence, and homeland security programs that monitor and protect critical American computer networks and sensitive information, specifically those tasked with protecting networks from damage caused by cyber attacks.
- **Ensuring U.S. access to and ability to use space:** The Commission recommends that Congress ensure that the U.S. Department of Defense and the National Aeronautics and Space Administration have programs to provide access to space, protect space-based assets, and maintain adequate defense measures such as those required for rapid replacement of destroyed assets in space (the Operational Responsive Space framework).
- **Addressing weaknesses in U.S. intelligence capabilities focused on China's military:** The Commission recommends that Congress instruct the director of national intelligence to conduct a full assessment of U.S. intelligence capabilities vis-à-vis the military of the People's Republic of China, and identify strategies for addressing any U.S. weaknesses that may be discovered as part of the assessment
- **Assessing potential Chinese military applications of R&D conducted in China by U.S. companies:** The Commission recommends that Congress direct the U.S. Department of Defense to evaluate, and, in its *Annual Report to Congress on the Military Power of the People's Republic of China*, to report on, potential Chinese military applications of R&D conducted in China by U.S. companies.

- **Engaging China to address global climate change/environmental degradation:** The Commission recommends that Congress urge the Administration to engage China to address global climate change/environmental degradation and identify opportunities for further U.S.-China cooperation.
- **Establishing joint efforts with China to monitor, determine the costs of, and prevent pollution:** The Commission recommends that Congress encourage the Administration to seek opportunities with China for (1) joint study of the economic and social costs of environmental pollution, (2) joint projects to monitor more effectively and transparently relevant environmental pollutants, and (3) joint projects to prevent pollution by use of nonpolluting energy sources and technologies and application of technologies to reduce pollution from carbon fuel combustion (such as carbon capture and sequestration techniques).
- **Assisting Taiwan to strengthen its military:** The Commission recommends that Congress encourage the Administration to continue to work with Taiwan to modernize its military and enhance Taiwan's capabilities for operating jointly with U.S. and allied forces, and make available to Taiwan the defensive weapons it needs for its military forces.

INTRODUCTION

As it prepares to host the 2008 Summer Olympic Games, China is presenting to the world the image of a confident and benevolent world power. But that image stands in contrast to a number of actions by and policies of China's authoritarian government. As a result, Beijing presents enormous challenges for U.S. policymakers who hope to see China move along a path of reform.

Today a prospering China welcomes another year of double-digit growth in its economy and a soaring stock market, and it recognizes that its free market reforms are the engine of its success. However, it is becoming apparent that China's leadership, both in the central government and at the local level, is nervous about the pace and extent of further market-based reforms. In addition, China's leadership continues to avoid political reform by suppressing political dissent and blocking efforts of most groups in the society other than the Communist Party—for example, workers trying to organize and citizens attempting to practice their religion freely.

The Commission has been given the responsibility by Congress to advise it on economic and security policy toward China. Our findings are contained in this, the Commission's fifth major Report to Congress. Contributing to this effort, the Commission held six hearings in Washington DC, and one in Chapel Hill, North Carolina. Commissioners attended three classified intelligence briefings in Washington, DC, and a full day of classified briefings on China's scientific, technological, and military capabilities at Wright-Patterson Air Force Base, Ohio, and are preparing a classified report on those subjects. Commissioners also visited the cities of Beijing, Dalian, and Shenyang in mainland China, as well as Hong Kong; Taipei and Kaohsiung, Taiwan; and New Delhi, India. The Commission contracted for independent research pertaining to topics the Commissioners view as important to consideration of key issues in U.S. policy toward China.

The Commission's conclusions as presented in this Report are a mixture of good news and bad. China has taken a constructive role in reaching agreement among six nations to dismantle North Korea's nuclear weapons production capacity. China has agreed to send a combat engineering battalion to Sudan to help with the U.N.'s peacekeeping and reconstruction activities there, and is showing signs of interest in strengthening its export control system to limit proliferation. China's economic policies have helped lift 200 million of its people out of poverty, and its leaders also have begun to acknowledge the widespread environmental degradation of China's air and water.

Among the problem areas identified by the Commission in 2007 are China's continuing harassment of journalists, bloggers, Internet users, whistleblowers, environmentalists, human rights advocates, and citizens who attempt to disseminate non-official versions of

events within China. The costs of such restrictions have become all the more obvious through many recent reports in the Western press about long-standing safety and health concerns of international as well as Chinese consumers who have been exposed to adulterated and dangerous toothpaste, baby formula, and cough syrup. Allowing the Chinese news media to fully report on such domestic scandals earlier might have led to more effective solutions to the problem within China, and controls on exporting tainted products out of China.

Some of the Commission's research during the year involved issues addressed in previous Commission reports, including a number of World Trade Organization compliance problems. China still is not enforcing its own laws against intellectual property theft. As in the past, the problem revolves around China's lax enforcement and its preference for civil fines rather than criminal prosecutions for large transgressions. China also has done little to address repeated complaints from the United States and the European Union about its extensive subsidies to manufacturers. Those subsidies include discounts on loans and land, electricity, water, waste treatment, and roads. In some cases, China provides lax environmental and labor law enforcement for favored industries. Tax holidays and rebates on exports also are available for favored industries. China maintains limited market access for American entertainment software, principally movies. Each one of these issues is the subject of a WTO complaint against China by the United States.

The Commission is disappointed that Beijing's efforts to move in the direction of a market economy appear to be slackening. In particular, the government's decision to retain state ownership or control of a large block of the economy is disappointing. In accord with its 11th Five-Year Plan, China has designated a dozen industries, including telecommunications, civil aviation, and information technology, as "heavyweight" or "pillar" industries over which it intends for government to retain control. In addition, 155 of China's largest corporations remain state-owned, including nearly all the nation's largest banks. Much of the economy remains under the Chinese government's strict control. Beijing's provision of subsidies to its pillar industries may damage competitors in other countries—including the United States where companies do not receive such subsidies.

Other Chinese economic policies, especially China's pursuit of energy assets to fuel its economic growth, raise particular challenges. Rather than rely on international oil markets to supply its energy needs as most nations do, China shows a growing reliance on owning oil at the wellhead that easily could cause significant market disruptions if prices continue to stay high and supplies remain tight. In addition, this policy has led China to develop close relationships with countries such as Iran, Sudan, and Burma, and this has made it more difficult for China to cooperate in multilateral efforts to address the human rights issues and other important challenges that these countries pose.

Congress needs to consider the growing unease in Asia about China's militarization and its strategic intentions in the Western Pacific/East Asia region. The Commission examined China's growing military power in classified briefings, in hearings, and during

its trips to Asia. The Commission concluded that China is developing its military in ways that enhance its capacity to confront the United States. For example, China has developed the capability to wage cyber warfare and to destroy surveillance satellites overhead as part of its tactical, asymmetrical warfare arsenal. With its highly developed reliance on systems of command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR), the American military is significantly exposed to such attacks. China also could target America's critical infrastructure in a confrontation. In the realm of traditional warfare, China is acquiring the ability to overwhelm the defenses of, and successfully attack, U.S. carrier battle groups.

Creating further uncertainty about China's military and foreign policy intentions is its reluctance to release more details about its military spending. Without such information, Americans are left with little choice but to draw adverse inferences about China's intentions from its focus on cyber warfare and anti-satellite weapons, its construction of two ballistic missile submarines, and its purchase from Ukraine of a former Soviet aircraft carrier. New generations of fighter aircraft, spacecraft, submarines, missiles, and other sophisticated weapons are coming off China's production lines, but China has been reluctant to discuss how its military spending fits into its overall foreign policy goals.

Similarly troubling are the conclusions the Commission reached concerning China's growing reliance on industrial espionage. China continues to supplement its acquisition of new technologies from commercial transfers and direct production partnerships with a large-scale industrial espionage campaign.

China's growing trade surplus with the United States also is worrisome. In the first eight months of 2007, China's trade surplus in goods rose to \$163.8 billion, up 14 percent from the same period a year earlier. China's trade surpluses already have helped create the world's largest single pool of foreign currency. United States policymakers are concerned about the China Investment Corporation recently created by the central government. The CIC will manage a portion of China's \$1.43 trillion in foreign currency reserves, which thus far have been invested mostly in dollar-denominated bonds. But the record size of China's foreign funds holdings and the fund's rapid growth are raising concerns about the direction of future investments and the impact they could have on the U.S. economy.

China's unwillingness to accelerate the pace of its currency appreciation—or at least to allow the international currency markets to have more influence over the value of the renminbi—remains a major disappointment. Since China announced in July 2005 that it would allow the renminbi to fluctuate within a narrow trading band against a basket of currencies, the renminbi has appreciated less than 10 percent against the dollar. Meanwhile, China's global trade surplus is growing at an ever-faster rate.

The Commission believes that none of these problems is insurmountable and that both governments must work diligently to build the trust and understanding essential to agreements to which the parties will adhere.

While the relationship between China and the United States is not the world's closest, there is little disagreement it is one of the most important. The future for both nations—and, indeed, for the planet—significantly depends on the direction in which this relationship is taken by the two countries.

CHAPTER 1
**THE UNITED STATES-CHINA TRADE
AND ECONOMIC RELATIONSHIP**
**SECTION 1: THE RELATIONSHIP'S CURRENT
STATUS AND SIGNIFICANT CHANGES
DURING 2007**

The legislation passed by Congress in 2000 to establish the Commission sets forth specific topical areas of concern with respect to the People's Republic of China and associated issues, and requires the Commission to investigate and report to Congress on those topics. Congress has modified those topical areas in the intervening years. Today there are eight "mandated" topics. (They can be found at 22 U.S.C. 7002 and at the Commission's website—www.uscc.gov.) At the beginning of each section of this Report, the mandated topical area (or areas) that section addresses is identified.

"The Commission shall investigate and report on—

"WORLD TRADE ORGANIZATION COMPLIANCE—The compliance of the People's Republic of China with its accession agreement to the World Trade Organization.

"UNITED STATES-CHINA BILATERAL PROGRAMS—Science and technology programs, the degree of non-compliance by the People's Republic of China with agreements between the United States and the People's Republic of China on prison labor imports and intellectual property rights, and United States enforcement policies with respect to such agreements."

China's New Responsibilities

This year marks another milestone in the relationship between the United States and the People's Republic of China. As the year began, China faced the deadline to implement the great majority of the commitments it made to gain entry into the World Trade Organization after negotiating for 15 years to gain admission, and after phasing in reforms during a five-year transition period.

China, indeed, has met many of its WTO obligations, particularly those relating to lowering tariffs and making progress in removing such import barriers as its previous restrictions on distribution and sales of foreign goods within China. China also has partially

opened its doors to extensive foreign investment and foreign participation in its economy, although it has balked at outright foreign ownership in some sectors.^{1 2 3}

In addition, authorities can point to thousands of changes in China's laws and regulations intended to comply with WTO rules and procedures. "A large number of trade-related laws have been reviewed and revised as part of China's accession to the WTO," according to a comprehensive WTO review of legal changes.⁴ Officials of the central government in Beijing have been diligent in instructing their peers as well as provincial and local officials in their obligations under WTO membership.⁵

In the case of some important commitments, however, particularly those involving implementation and enforcement, China is lagging far behind schedule for meeting its actual WTO obligations for the marketplace. Three areas stand out starkly: China's extensive regime of state subsidies to favored industries, China's continued failure to stem the widespread theft of intellectual property, and China's manipulation of the value of the renminbi that creates an unfair trading advantage for China.⁶

As part of its agreement to join the WTO, China committed in 2001 to end government subsidies designed to spur exports. China, however, still maintains a wide array of such subsidies as part of a policy to attract foreign investment and to promote the development of certain sectors. China has not instituted an effective mechanism for protecting copyrights, trademarks, and patents from gross violations despite WTO requirements that it do so. In addition, China still manipulates the value of its currency through repeated intervention in the currency markets.⁷ In 2007, the United States brought to the WTO two complaints relating to some of these unmet obligations, one about China's lack of intellectual property protection, the other about its extensive restrictions on access to the Chinese market for American films, books, and music. A third WTO complaint focused on China's export subsidies.⁸

Authorities in China also have been reluctant to undertake negotiations to liberalize the economy further. For example, despite promises to do so, China has not begun talks to join the WTO's Agreement on Government Procurement that ensures a fair and transparent system for bidding on government contracts. Because an estimated 40 percent of China's economy remains under government control or outright ownership, there is a huge potential market—in addition to government offices at the central, provincial, and local levels—in which foreign suppliers are at a considerable disadvantage.⁹ China has agreed to follow generally accepted guidelines for government procurement, but use of WTO enforcement tools is not possible without a formal agreement.

In some cases, China appears to have backtracked on its WTO commitments. There has been "an upsurge in industrial planning measures as tools of economic development by China's central government authorities," according to the Office of the U.S. Trade Representative (USTR). "China appears to want to expand the government's role in directing the economy and in developing internationally competitive enterprises, while also restricting the role of international companies in certain sectors."¹⁰ This issue is examined in Section 2 of this Chapter.

Certain practices such as currency manipulation, which some have labeled mercantilist and are detailed below, have contributed directly to China's reputation as an unfair trader.¹¹ These practices have helped to make China the world's factory floor and provided it with the world's largest goods and services trade surplus, which reached \$177 billion in 2006.¹² By the end of September 2007, China's global trade surplus, at \$187 billion for the first nine months, had already surpassed last year's figure.¹³ The implications of China's export-oriented industrial policy also are apparent in China's rapidly increasing global current account surplus: \$250 billion in 2006, a 55 percent increase from the \$161 billion surplus in 2005.¹⁴ Also significant is China's enormous amount of foreign exchange reserves, reported by Beijing to be \$1.4 trillion by mid 2007, the largest in the world.¹⁵

China's most unbalanced trading relationship is with the United States. In 2006, China exported \$287.8 billion worth of goods to the United States and took in \$55.2 billion in imports from the United States. That left the United States with a trade deficit of \$232.5 billion. Imports from China exceeded exports to China by a ratio of more than five to one. China accounted for 26 percent of America's global trade deficit. (While U.S. exports to China are growing at a faster rate than are imports from China, the ratio is so imbalanced that the trade deficit continues to grow and it is inconceivable that the value of U.S. exports to China will equal imports from China in the foreseeable future.)

Table 1.1 U.S.-China Trade (US\$ Billions)

	1999	2000	2001	2002	2003	2004	2005	2006
U.S. Exports to China	13.1	16.3	19.2	22.1	28.4	34.7	41.8	55.2
Percent Change	-8%	24.4%	18.3%	14.6%	28.5%	22.2%	20.5%	32%
U.S. Imports from China	81.8	100	102.3	125.2	152.4	196.7	243.5	287.8
Percent Change	14.9%	22.3%	2.2%	22.4%	22.7%	28%	23.3%	18.2%
U.S. Balance	-68.7	-83.7	-83.1	-103.1	-124	-162	-201.7	-232.5

Source: U.S. International Trade Commission, 2007

In 2007, China's exports are growing faster still. For the first nine months of 2007, China's exports rose 27 percent, year over year, to \$878 billion.¹⁶ China's global current account surplus for the first four months of 2007 stood at \$63.3 billion, an increase of 88 percent from the same period last year. At this rate, China's current account surplus easily will exceed 10 percent of China's GDP this year, a record amount. In comparison, the U.S. global current account deficit reached a new high in 2006, rising to \$858 billion or 6.5 percent of GDP.¹⁷

China's exploding trade surplus illustrates just how central China's export-dependent industrial policy is to its overall economic strategy and helps explain why Chinese authorities are so reluctant to institute some particular reforms. In 2006, China's net export growth accounted for 25 percent of its overall economic expansion.¹⁸ Export growth's contribution to overall Chinese GDP remains at that level for the first half of 2007. In fact, net exports, or the trade surplus, constituted the largest single factor in China's economic expansion.¹⁹ By contrast, the U.S. trade deficit, (or net exports) subtracted 0.5 percentage points from U.S. GDP growth in the first quarter of 2007.²⁰

In the first seven months of 2007, China's exports of goods and services grew by 29 percent, compared with the same period last year. That created a trade surplus of \$137 billion,²¹ an 80 percent increase from the same period a year earlier.

Causes of the Imbalance

Economists and policymakers identify several causes for China's growing trade surplus with the United States, but no consensus exists on their relative importance. Also, not all the causes stem from unfair trade practices or WTO violations by China. For example, America's high productivity provides its manufacturers with a competitive edge. In the case of the most labor intensive industries, however, America's productivity does not compensate for the advantage conveyed by China's low wages and employee benefits and its restrictions on labor rights. In China in 2004, the average hourly wage rate of all workers was \$0.67.²² The average U.S. hourly production wage in 2004 was \$15.65.²³

Today, average hourly wages of production workers in the United States (exclusive of the value of fringe benefits) are about \$17.40.²⁴ This gives Chinese manufacturers a substantial edge in production costs, particularly after America's higher business expenditures on health care, pensions, worker and consumer safety, and environmental protections are taken into account.

Too much can be made of the wage differential, however. Wages account for only five percent of the total production cost for semiconductors and no more than 20 percent for clothing, for example.²⁵ The United States and Germany, whose workers enjoy among the world's highest earnings, also historically have been the world's largest exporters. Further, some nations with even lower wages than China are not large exporters proportionately.

In an attempt to delineate the reasons for China's low export prices, University of California professor Peter Navarro examined "major drivers" of Chinese competitiveness. He ranked the three most important drivers when he testified before the Commission:

Almost half of the China price advantage is [the result of] unfair mercantilist beggar-thy-neighbor policies which, in effect, are transferring jobs in a zero sum game between the U.S. and China. . . . [There are three predominant factors. The first is] currency manipulation. It's important, but not as important as you might think. The big item in the unfair trade practices is the export subsidies. [China provides] subsidized energy, water, virtually free capital to underper-

forming industries because the banks don't call in the loans, VAT tax rebates. There's just a whole web of complex subsidies that should be subject to WTO complaints and other types of complaints, but for some reason this town is silent on that. The third element is counterfeiting and piracy. The cost advantages vary by sector, but they include things like not having to pay for Information Technology, not having to pay marketing expenses to market your brand, and not having to do things like research and development which for pharmaceutical companies and industries like automobiles is particularly important.²⁶

Another factor frequently cited by economists to explain China's trade surplus with the United States is China's extremely high savings rate contrasted to the extremely low rate of savings in the United States. Chinese consumers save half their income according to some estimates; Americans save less than five percent of their disposable income and in some months dip into their savings. The personal savings rate in the United States was minus one percent in both the first quarter of 2006 and the first quarter of 2007, for example. U.S. business savings are in the positive range but are overwhelmed by government and household borrowing.²⁷ The U.S. Federal Government, which accounts for roughly a quarter of GDP, routinely runs large deficits in financing its expenditures—\$248.2 billion in fiscal 2006.²⁸ Total outstanding federal debt, the accumulation of all Federal Government borrowing, is nearly \$9 trillion or about 69 percent of GDP in 2006. China's public finances are in good shape, with a budget deficit below 1 percent of GDP in 2004 and public debt around 23 percent of GDP, down from 50 percent in 1999.²⁹

In fiscal 2006, the U.S. government paid \$406 billion in interest on its accumulated debt—\$80 billion of that to Chinese holders of U.S. Treasury securities.³⁰ For the past 20 years, foreigners have been buying more Treasury securities than has the U.S. public and an estimated 54 percent of Treasury securities are now in foreign hands. The United States is now the world's largest debtor.³¹

In contrast to "dissavings" by the U.S. Federal Government and citizens, Chinese personal savings add to China's ability to finance investments and infrastructure improvements, a fact that has been acknowledged by economists and U.S. policymakers alike. There is general consensus on the cause as well. Chinese workers exercise "precautionary savings" in order to make up for a lack of government-sponsored education, pensions, and health care. Meanwhile, insurance and consumer and home mortgage credit are far less available to Chinese consumers.³²

Only about one-seventh of the [Chinese] population, for example, is covered by basic health insurance, so many households save to cover medical expenses. Families also save for retirement because the basic pension scheme covers only about 16 percent of the economically active population—and in any case provides a pension equal to just 20 percent of average wages. Finally, households save for education. Primary school fees are a large financial burden, particularly for poorer rural households.³³

Particularly hard hit are those who live in rural areas where closings of health clinics and schools formerly operated by now-defunct state-owned companies have created great hardship. China has not yet developed a pension system, which forces the elderly to rely on China's traditional means of providing for old age—their children. But China's one-child policy has limited this means of retirement support. Chinese officials have acknowledged these problems and have stated an intention to provide better government services.

Economic theory holds that a high savings rate encourages businesses to invest in factories, equipment, and software. This shift stimulates investment-led growth in the economy and leads to industrial over-capacity. This is typical of China today, where businesses have easy access through banks to the considerable savings of Chinese workers.

Because savings are inversely proportional to spending, Chinese workers who choose to save much of their earnings necessarily limit their purchases. Workers therefore pass up luxury items and discretionary purchases, which tend to be imported goods, in order to concentrate their spending on essentials that generally are produced within China. What goods China does import from the United States tend to be manufacturing inputs such as metal scrap, electronics for recycling, or capital goods such as electrical machinery and commercial aircraft used to generate business income. In fact, while 70 percent of GDP in the United States is consumption, the figure for China is 41 percent.³⁴

Another explanation for China's rising global trade surplus is its role as the final assembler of Asian and American parts and components into finished products. Manufactured goods assembled in China from imported parts now account for about 55 percent of China's total exports and about 65 percent of the goods China exports to the United States, according to one estimate.³⁵ The entire value of such goods exported from China to the United States is counted as Chinese exports, regardless of where their components originated or the amount of value added in China.

Foreign investment flows provide another explanation for China's trade surpluses. The large amount of foreign investment in China is concentrated in manufacturing, which frequently produces goods intended for export. The cumulative level of foreign direct investment (FDI) in China at the end of 2006 reached \$698 billion, placing it among the world's largest destinations for FDI. (U.S. investors accounted for \$54 billion of that total.) China's largest recipient sector last year was manufacturing, accounting for 58 percent of the total.³⁶ More than half of China's exports in 2006 originated from foreign-invested factories.³⁷

Table 1.2 Top Ten Origins of Foreign Direct Investment in the People's Republic of China*

Country/Region of Origin	Amount Invested 2005 (\$ billion)	Amount Invested 2006 (\$ billion)	Year-on-Year Growth (%)
Hong Kong	\$17.95	\$20.23	13
British Virgin Islands	\$9.02	\$11.25	25
Japan	\$6.53	\$4.60	-30
South Korea	\$5.17	\$3.89	-25
United States	\$3.06	\$2.87	-6
Taiwan	\$2.15	\$2.14	-1
Singapore	\$2.20	\$2.26	3
Cayman Islands	\$1.95	\$2.1	8
Germany	\$1.53	\$1.98	29
Western Samoa	\$1.36	\$1.54	13

*Note: Does not include financial sector flows. Source: MOFCOM, U.S.-China Business Council

One cause for the trade imbalance between China and the United States on which most economists and policymakers agree, however, is China's manipulation of its currency. In simple terms, maintaining a low value for the renminbi means that Chinese exports will be cheaper than they would be if the currency were allowed by the central government to rise in value in response to market forces. Conversely, U.S. exports to China are more expensive when purchased with undervalued renminbi. The result is that Chinese goods are cheaper in the United States and American exports are more expensive in China. How much of an advantage that disparity provides to China is in dispute. Not in dispute is the fact that the undervalued renminbi provides China with an off-budget job and export subsidy.³⁸ Mr. Grant Aldonas, former Under Secretary of Commerce in the George W. Bush Administration, told the Commission, "There is no doubt that the Chinese have to intervene massively in the currency markets in order to maintain their peg to the U.S. dollar. And, there is no doubt in my mind that the intent is mercantilist—they want to keep exporting to the United States because of the employment that their export production provides in an economy where they have to create many millions of jobs every year just to keep up with the growth in their population."³⁹

Economists who have studied the issue have estimated that the renminbi is from 20 percent to 50 percent below where it would be relative to the dollar if it were traded freely on international currency markets.⁴⁰ No one can be certain because the international currency markets have not been given the opportunity to set a price for the renminbi. As a point of reference, the Peterson Insti-

tute for International Economics estimates that a 20 percent revaluation of the renminbi, matched by other Asian currencies now pegged to the dollar, would reduce the U.S. global current account deficit by up to \$80 billion per year, or about 10 percent.⁴¹ In contrast, most developed nations do allow their currency to be traded on the open market and intervene only occasionally to try to temporarily influence short-term price swings. Such nations include the United States, the United Kingdom, the European Union, Sweden, Switzerland, Australia, Canada, and Japan. Some of China's Asian neighbors also keep their currencies undervalued against the dollar so as to remain competitive with China on exports. As China has done, Hong Kong, Taiwan, Malaysia, and Korea have purchased U.S. dollars in an effort to control the value of their currencies.⁴²

There is somewhat less agreement on why China's government has been so adamant about controlling the value of the renminbi rather than letting it seek its natural market value. China contends that it must limit the renminbi's rate of appreciation to protect China's fragile banking system, citing the example of Japan whose yen rose in the mid 1980s after which there was a decade of declining asset values, bank failures, and slow growth. Critics of China point out that currency manipulation has long been an effective tool for gaining an export advantage—so much so that rules of the International Monetary Fund proscribe members from pegging their currency except in very limited circumstances—for example, when a country is about to run out of foreign exchange entirely.

With China holding the world's largest foreign exchange reserves, it is in no danger of running low on foreign currencies to pay for imports. Chinese officials also worry that any deviation from China's high economic growth rate, averaging about nine percent over the past two decades, would make it difficult to provide jobs for a growing population and for the workers who increasingly leave rural areas for higher wages in the coastal manufacturing hubs. However, using currency manipulation to accomplish such economic policy goals amounts to exporting unemployment.

China accomplishes its dollar peg by purchasing about \$20 billion each month at a fixed rate against the dollar. Without those purchases, the supply of dollars in circulation in China would rise and lose value relative to the renminbi. Without the fixed rate, the value of the renminbi also would be expected to rise. Critics of China's currency policy have suggested that China revalue its currency by fiat, much as it last did in July 2001, and reduce its purchases of dollars and allow Chinese citizens to hold and invest dollars.

Under considerable pressure from the U.S. Administration and Congress, China has taken some small steps in this direction, all the while claiming that the government will not respond to pressure. In July 2005, China engineered a 2.1 percent overnight rise in the value of the renminbi and announced a policy that would allow a "managed float" of the renminbi within a very narrow daily trading band of 0.3 percent. Shortly before the second Strategic Economic Dialogue in May 2007, the trading band was raised to 0.5 percent. In July 2007, China announced that it no longer will attempt to purchase all the dollars flowing into the country—as a result of exports or foreign investment—but rather that it will leave

some of the dollars in the hands of Chinese citizens who presumably will invest them.⁴³ In theory, this step should add to the upward pressure on the renminbi. China also has announced that it plans to allow its citizens to buy the shares of some foreign stocks listed on the Hong Kong exchange, although the date of the proposed change has been postponed indefinitely and questions persist about the methodology that will be employed.

These are all welcome steps, but they are too small to have a significant effect on the growing trade imbalance between the United States and China. Since a small 2.1 percent revaluation July 21, 2005, at which time the renminbi was allowed to fluctuate within a narrow trading band, the renminbi has increased in value only an additional 7.4 percent against the dollar because the Chinese central bank seldom allows it to climb the maximum amount within its daily trading band.⁴⁴

The suppression of worker rights in China also has been identified by critics as a reason for China's unfair export price advantage and its trade surplus. The AFL-CIO twice has petitioned the Administration to undertake a Section 301 investigation⁴⁵ of the violation of workers' rights as an unfair trade practice.⁴⁶ The Administration rejected the petitions, filed in 2004 and 2006, and has not launched an investigation. In its response, the USTR said an investigation was not necessary "to know that there are serious concerns with labor rights and working conditions in China."⁴⁷ The Administration said it preferred to pursue the matter in negotiations and by providing "technical cooperation to further advance labor laws and workplace protections."

But workers in China still are not provided basic rights. China has developed "a political agenda that requires repression of free speech and free association, and the prohibition of independent unions or other non-governmental organizations that might challenge the government's power," Ms. Thea Lee, the AFL-CIO's policy director, told the Commission. "Labor [in China] is not just cheap. It is deeply disenfranchised and disempowered, which leads to horrible abuses of workers' individual liberties, but also to dangerous and unsafe working conditions, unpaid wages, and abuse of prison labor."⁴⁸ Bringing a case to the WTO alleging the suppression of workers' rights as an unfair trade practice is supported by Mr. Aldonas: "Even if we lost, [it would be desirable] just to highlight the fact that this ought to be on the agenda in any trade negotiation we enter into."⁴⁹

The WTO Cases

The Administration thus far has chosen not to bring a WTO case against China on the currency issue or to bring a formal complaint to the International Monetary Fund that has some jurisdiction over international currency matters. Nor has the U.S. Department of Treasury in its biannual reports on global currency manipulation been willing to cite China for that transgression. The Administration has justified its decision not to cite China by pointing to the 1988 law that requires the report, to a provision stating that a country can be cited only if it has deliberately manipulated its currency value to gain an export advantage.⁵⁰ The Administration ar-

gues that it cannot discern Chinese leaders' intent and therefore cannot cite China for currency manipulation. Several bills have been introduced in the U.S. House and Senate to address this discrepancy.

The Administration did bring three WTO cases against China in 2007, citing China's lack of intellectual property protection; the limited market access in China for U.S. books, journals, movies, videos, and music; and China's widespread industrial subsidies. As of this Report's publication, none of the three cases has yet been adjudicated by a WTO panel.

Like all WTO members, China is required to comply with international norms to protect copyrights, patents, and trademarks. Although China has passed many regulations and laws to comply, and has signed nine memoranda of understanding and other agreements with the United States and others to adhere to international standards, even it agrees that its enforcement is lacking. In marked contrast to his statements the previous year, during the Commission's April 2007 trip to China, Mr. Jin Xu, the Deputy Director General of the Ministry of Commerce, acknowledged that China's actual protection of intellectual property rights (IPR) is lagging behind its promises. Mr. Qui Zhongyi, from the State Intellectual Property Office (SIPO), acknowledged that IPR protection now is considered important for China's own economic and political development.

Losses to U.S. industries have been severe, according to the USTR complaint. Citing 2006 industry sources, the USTR reports that piracy in China "across all lines of copyright business ranges between 85 percent and 93 percent, indicating little or no improvement over 2005."⁵¹ Those industries include "films, music and sound recordings, publishing, business and entertainment software, pharmaceuticals, chemicals, information technology, apparel, athletic footwear, textile fabric and floor coverings, consumer goods, food and beverages, electrical equipment, [and] automotive parts and industrial products, among many others." The Congressional Research Service estimates that counterfeits constitute 15 to 20 percent of all products made in China and account for about eight percent of China's GDP.⁵²

Most critics of China's intellectual property protection record fault its weak enforcement rather than point toward inadequacies in its laws and regulations. The vast majority of cases are handled as civil rather than criminal matters, and moderate fines are the typical outcome. Such fines are not sufficient to deter counterfeiters from their highly profitable businesses. For example, retailers are able to stock 499 pirated DVDs and CDs without facing criminal prosecution.⁵³ Even that is an improvement. The previous 2006 judicial threshold for criminal prosecution required 1,000 or more pirated DVDs or CDs. Some high profile cases are concluded with press conferences in which the media record bulldozers running over pirated DVDs and CDs. Inside the adjacent counterfeit factory, however, the owners are permitted to dismantle the reproduction equipment and ship it to another facility where the counterfeiting starts anew.⁵⁴ The U.S. complaint to the WTO notes that Chinese "rules appear to permit goods to be released into commerce following the removal of fake labels or other infringing features,

when WTO rules dictate that these goods normally should be kept out of the marketplace altogether.”⁵⁵

China is moving very slowly to comply with WTO requirements on IP protection, such as lowering the threshold for some criminal prosecutions by considering the retail value of counterfeit goods seized rather than the raw material or production value. Mr. Qui of SIPO insisted to the Commission in April 2007 that China’s measures were not the result of pressure from the United States, but have been taken because they are in China’s own interests. Regardless of whether it is doing so because of pressure from the United States and other WTO members or for its own self interest, China’s pace in reforming its IPR regime indicates reluctance rather than willingness.

There have been encouraging signs of increased cooperation by China in the pursuit of large counterfeiters. In July 2007, for example, a joint investigation by the Federal Bureau of Investigation and Chinese authorities resulted in 25 arrests and the seizure of 290,000 CDs containing counterfeit Microsoft and Symantec software.⁵⁶ One organization that tracks compliance with intellectual property enforcement, the International Intellectual Property Alliance, surveyed members in China and found the raid had little effect. Eric Smith, President of the organization, testified before Congress that the highly visible “100 days campaign” resulted in “very little change in the market.” Mr. Smith said, “The [authorities] take the pirated product out of the store, but the store reopens the next day and the pirated product goes into a catalogue and is sold online the next day.”⁵⁷

The Chinese government historically has undertaken high profile enforcement actions just prior to major diplomatic meetings with U.S. officials. A better indicator of China’s intent would be weekly, if not daily, enforcement actions receiving prominent coverage in government controlled media.

The WTO case against China on market access is directly linked to the piracy problem. While China has dismantled its state-owned distribution networks for most imports into China, it still maintains state restrictions for U.S. copyright-intensive industries such as books, movies, CDs, DVDs, and video games and their distribution. China severely limits the showing of foreign films. The American film industry, which counts on foreign sales for half its total revenue, pegged its losses in 2005 at \$244 million in China alone, not counting pirated DVDs exported from China. Nine of every 10 DVDs sold within China are counterfeit, according to Mr. Dan Glickman, President and CEO of the Motion Picture Association of America (MPAA).⁵⁸ The industry lost \$6.1 billion to piracy worldwide according to MPAA figures,⁵⁹ due in part to exports of those Chinese DVDs.

Unable in many cases to see the movies that they read so much about, Chinese consumers turn to pirated DVDs sold cheaply on the street. The central government, despite its protestations and the evidence it offers of strengthened laws and regulations, plays an indirect but strong role in encouraging piracy of American entertainment software by limiting legitimate distribution.

The third U.S. complaint against China filed in 2007 with the WTO concerns a different matter entirely: China’s subsidies to fa-

vored industries intended to support China's goal of boosting China's net exports. At issue are six subsidies tied to export performance and three subsidies meant to discourage purchases of imports in favor of domestically produced goods.

Both categories of activities violate the letter and the spirit of the WTO's rules. Among the subsidies prohibited by those rules, according to the complaint, are income tax reductions and refunds for companies that satisfy certain export requirements, value-added tax (VAT) exemptions and tariff reductions for exporters, discounted lending rates for exporters, exemptions from mandatory worker benefit contributions for exporters, and VAT refunds for companies that purchase Chinese-made equipment and accessories rather than imports.

The Chinese government has noted that many of these subsidies are available to U.S.-based manufacturers that have moved some operations to China. The argument is that since such subsidies also benefit American companies operating in China, there is no harm. Those subsidies, however, certainly have harmed small and medium-sized enterprises (SMEs) that have maintained their operations in the United States and so cannot take advantage of the subsidies.⁶⁰ These SMEs compose a critical portion of the U.S. manufacturing sector, providing 40 percent of the value and 60 percent of the number of manufacturing jobs in America.⁶¹ About 90 percent of U.S. exporters to China are SMEs, and these account for over 35 percent of U.S. merchandise exports to China. "Every sale lost to subsidized products disproportionately impacts SMEs and can threaten a company's continued financial viability, given the smaller size of SMEs and more limited financial resources."⁶²

Conclusions

- China's trade surplus with the United States is growing dramatically, due in large part to its financial and economic policies that stimulate exports and discourage imports. China's trade surplus with the United States in goods through August 2007 rose to \$163.8 billion, an increase of 14 percent over the \$143.3 billion surplus during the equivalent period in 2006. By mid-2007, China had accumulated \$1.43 trillion in foreign currency reserves, up from \$1.2 trillion in 2006. An estimated 70 percent of those reserves, or about \$1 trillion, are invested in dollar denominated assets, mostly U.S. government and corporate bonds.
- Following a five-year phase-in period, China is largely complying with the World Trade Organization's procedures, rules, and regulations, at least on paper. While China has rewritten thousands of laws and regulations, major improvements are still needed in implementation and enforcement. China's performance is notably weak in the areas of intellectual property protection, maintenance of a market-based currency regime, and compliance with the WTO's prohibitions on export subsidies.
- China's economy remains heavily dependent on manufactured exports to sustain its rapid economic growth and to provide jobs for a rural population moving to urban areas in search of higher pay and benefits. Chinese authorities have not been willing to alter

this pattern, even if pushing exports means violating WTO rules or free market principles.

- China's trade relationship with the United States is severely out of balance, with its exports to the United States exceeding its imports by a ratio of more than five to one.
- Beijing has been slow to translate three decades of record economic growth into a better life for all its citizens by enhancing government programs for education, pensions, and health care. Nor has China encouraged financial services reform to allow its citizens to enjoy the benefits of consumer credit and affordable insurance. As a result, Chinese workers save much of their income to enable them to contend with life's vicissitudes and they purchase few imported goods.
- The artificially low value of the renminbi provides a subsidy for Chinese exporters and serves as a hindrance to Chinese importers and consumers.
- China's mercantilist policies are taking a huge toll on small and medium-sized manufacturing facilities and their workers in the United States. While U.S.-based multinationals can transfer and have transferred much of their production to China to serve that market, small and medium-sized manufacturers in the United States are not as mobile. They face the full brunt of China's unfair trade practices, including currency manipulation and illegal subsidies for Chinese exports. This is significant because small and medium enterprises (SMEs) represent 60 percent of the manufacturing jobs in America.

SECTION 2: THE CONTROL OF CHINA'S ECONOMY BY ITS GOVERNMENT, AND THE EFFECT ON THE UNITED STATES

“The Commission shall investigate and report on—

“WORLD TRADE ORGANIZATION COMPLIANCE—The compliance of the People’s Republic of China with its accession agreement to the World Trade Organization.

“ECONOMIC TRANSFERS—The qualitative and quantitative nature of the transfer of United States production activities to the People’s Republic of China, including the relocation of high technology, manufacturing, and research and development facilities, the impact of such transfers on United States national security, the adequacy of United States export control laws, and the effect of such transfers on United States economic security and employment.”

China’s Industrial Policies

The decisions by Presidents Bill Clinton and George W. Bush and by Congress to support the entry of China into the World Trade Organization (WTO) were predicated on expectations that membership would commit China to a path toward free-market capitalism. Six years after joining that body, China is still trudging along the path of economic liberalization, with a mixed record of meeting its many WTO accession commitments. Although China has had some notable successes, concerns are now growing over the pace and direction of China’s economic reforms.

Certainly the current version of China’s economy bears little resemblance to the one that existed three decades ago. China has made extensive market reforms that contributed to the impressive economic growth rates it has seen over the last thirty years. China’s industrial output in 2000 was ten times what it was in 1978 when Deng Xiaoping initiated his economic reform program and opened China to the outside world.⁶³ Also, Chinese poverty has declined significantly; between 1981 and 2001 the proportion of China’s population living on an income below the level the World Bank defines as China’s poverty line⁶⁴ dropped from 53 percent to just eight percent.⁶⁵ Economic liberalization has benefited China enormously.

The Chinese Communist Party’s (CCP) ultimate goals for economic liberalization may not match the expectations of many in the West, however. Recent CCP actions and announcements indicate that Beijing has no intention of giving up control over significant

elements of the economy or relinquishing its outright ownership of key industrial and high technology sectors. This dynamic is particularly apparent in the efforts of China's government to retain control of a large number of state-owned enterprises.

It now is becoming evident that Beijing plans to reform its economy only partially, embracing elements of both free-market capitalism and centralized planning. While the Chinese prefer to call this system "capitalism with Chinese characteristics," economists testifying before the Commission used such terms as "a partially marketized economy,"⁶⁶ "an economy with private elements,"⁶⁷ "state-guided capitalism,"⁶⁸ and "a politicized and government-distorted market economy."⁶⁹

Chinese State-Owned Enterprises

The Congressional Research Service defines state-owned enterprises (SOEs) as those firms in which a central or local government holds an equity stake, either directly or through a holding company, sufficiently large to give it control over the firm.⁷⁰ Because China's regulatory systems are opaque, it can be difficult to trace the ownership of any enterprise in China. Beijing has been able to shroud its stake in a variety of firms by listing a portion of each such enterprise on public exchanges while maintaining ownership of the remaining equity, usually through a parent company.

While China's state-owned business sector is greatly diminished from its pre-1978 reform period, it still is a major factor in China's economy.⁷¹ The current number of SOEs is thought to be roughly 127,000.⁷² Even more important, China has indicated it intends to revitalize significant numbers of its failing state-owned companies with a wide variety of subsidies that would violate free market principles and China's WTO commitments. This would represent a large step backward from the expectations of the American proponents of China's entry into the WTO. The result would be a unique hybrid economy with a scale that could create serious challenges and potential harm for the world economy.

The reduction in size of China's state-owned sector has resulted from efforts to consolidate the strongest state-owned enterprises and to allow the weakest to "fade away."⁷³ SOEs made up 38 percent of industrial output in 2004, down from 49.5 percent in 1998, a reduction of 23 percent.⁷⁴ SOE employment numbers also have fallen. In the early 1990s, SOEs employed an estimated 70 million workers. By 2003 that number had declined to 40 million.⁷⁵

Local governments, rather than the central government in Beijing, own and direct the majority of the smaller SOEs. In 2002, local governments' share of total employment in the state-owned sector stood at 76.3 percent.⁷⁶ Most of these smaller, local SOEs operate at a loss and rely on government subsidies to remain viable. Many of these firms once had been operated by the central government but have been transferred to local authorities in the hope they might be "turned around" to profitability, privatized, or closed. Many of them remain open to maintain local employment levels and, in some cases, to provide illicit income for corrupt local politicians. But as the smaller, local SOEs have been shrinking in number and importance, the larger but fewer centrally-owned SOEs

have been gaining in importance.⁷⁷ “The local sector [SOEs] ... seem to be steadily ... privatized and transformed [with] the local government officials act[ing] more like entrepreneurs,” says Dr. Barry Naughton of the University of California/San Diego.⁷⁸

The central government plays a small role in the activities of the local SOEs and instead focuses on several hundred larger firms that Beijing sees as critical to China’s future. While local SOEs do employ the majority of the state-owned sector’s workforce, the central government controls a disproportionately large share—48.3 percent—of the state-owned sector’s assets.⁷⁹ The firms that fall in this category are the principal beneficiaries of much of China’s industrial policy.⁸⁰

Dr. Naughton quoted a senior Chinese official as saying, “state ownership is appropriate in four sectors: national security, natural monopoly, important public goods or services, and important national resources. In addition, a few key enterprises in ‘pillar’ (priority) industries and high-tech sectors should be maintained under state ownership.”⁸¹ Dr. Naughton testified that “the five sectors of oil, metallurgy, electricity, telecommunications, and military industries represent two-thirds of the labor force and three-quarters of the capital in [the] state sector core.”⁸²

The largest state-owned firms fall under the Chinese version of a holding company: the State-Owned Assets Supervision and Administration Commission (SASAC). SASAC was created to “manage the [CCP’s] efforts to control more effectively China’s SOEs, while increasing the SOEs’ economic returns and maintaining the political returns to the government.”⁸³ SASAC has jurisdiction over China’s best SOEs and has been given explicit instructions to advance a number of the CCP’s economic goals.

SASAC’s mandate directs it to consolidate its control over larger SOEs and dispose of smaller ones. To accomplish this goal, SASAC divided tens of thousands of SOEs into two groups: those from strategic industries to be owned by the central government and the remainder to be run by provincial and local governments with help from the Ministry of Finance. The smallest and weakest were, in many cases, given to local authorities to shut down or merge. Through restructuring and consolidation, SASAC appears to have pared its list from the original 198 companies to 155 companies.⁸⁴

SASAC has been candid in revealing its plans for China’s state-owned enterprises. These include its intentions to provide government subsidies to the “national champions” it intends to create. The “goal of reforming is to reorient state capital away from poorly performing companies in non-crucial areas to priority sectors,”⁸⁵ explained Shao Ning, Vice Minister of SASAC.

In December 2006, SASAC and China’s State Council jointly announced the “Guiding Opinion on Promoting the Adjustment of State-Owned Capital and the Reorganization of State-Owned Enterprises.” The Guiding Opinion identifies seven “strategic industries” in which the state must maintain “absolute control through dominant state-owned enterprises,” and five “heavyweight” industries in which the state will remain heavily involved. (See the box below.) *China Daily* and the *Asia Times* estimate that between 40 and 50 of the 155 SASAC-controlled SOEs are engaged in the seven “absolute control” sectors, accounting for 75 percent of SASAC’s

total assets⁸⁶ and as much as 79 percent of SASAC's total profits.⁸⁷ They include such highly profitable companies as China Mobile, PetroChina, and Air China. A complete list of these SOEs is included as Appendix VII-C.⁸⁸

**INDUSTRIES THE PEOPLE'S REPUBLIC OF CHINA HAS IDENTIFIED
AS "STRATEGIC" AND "HEAVYWEIGHT"**

Strategic Industries:	Heavyweight Industries:
1) Armaments	1) Machinery
2) Power Generation and Distribution	2) Automobiles
3) Oil and Petrochemicals	3) Information Technology
4) Telecommunications	4) Construction
5) Coal	5) Iron, Steel, and Non-Ferrous metals
6) Civil Aviation	
7) Shipping	

According to China's official news agency *Xinhua*, the "Guiding Opinion proposes 10 actions to promote the reorganization of state-owned enterprises, including stock exchange listing for sound companies and the addition of foreign investors."⁸⁹ Other proposed actions include shutting down money-losing companies, reorganizing management in other firms, linking manufacturers to state research institutes, and tightening budget controls.

The announcement indicates that Beijing may be looking to foreign, or "strategic," investors to help China create what economic planners like to call "market socialism." This phenomenon already can be seen at work in the information technology sector to which SASAC attached such great importance. Dr. Zhi Wang, an economist at the U.S. International Trade Commission, recently said that 90 percent of China's high technology exports to the United States are from Foreign Invested Enterprises (FIE), many of which involve joint ventures with Chinese firms.⁹⁰ American venture partner companies may be helping a SASAC-targeted industry climb the technology ladder.

Beijing goes to great lengths to hide the fact that many Chinese firms thought to be private are, in fact, SOEs. Many companies in China whose stocks are traded on China's exchanges are in reality SOEs in which the government keeps as much as a 75 percent stake, says Mr. Frederick Jiang, manager of the Ivy Pacific Opportunities Fund. By only listing part of an SOE on domestic exchanges, the Chinese government is able to maintain control of the firm. This association with China's government "often means the companies are assured of maintaining their dominant position,"⁹¹ said Mr. Jiang. Studies have shown that when foreign investment capital is attracted to SOEs through this opaque process, there typically is an increase in their competitiveness. "Foreign capital participation in an SOE is associated with higher innovative activity. . . . There is a positive effect of FDI on SOEs that export, invest in human capital or R&D, or have prior innovation experience."⁹²

Of course, at the same time, Beijing isn't anxious to see control of its strongest SOEs pass to foreigners. The State Council reportedly is planning to establish an interdepartmental committee to

“scrutinize large-scale mergers or acquisitions of state-owned enterprises by foreign companies.”⁹³

Another way for Beijing to support companies in SASAC’s favored industries is to use government subsidies. SASAC public pronouncements confirm what external studies have already observed: China already is deeply involved in such activity. University of New Haven professor George Haley testified before the Commission that these subsidies are most frequently provided at the provincial and municipal levels in China. They are listed in the box below:

Forms of Provincial and Municipal Government Support for SOEs⁹⁴

- 1) *Low Cost Loans.* Provincial governments use their influence over the state banks to ensure that SOEs receive low-cost and sometimes free loans that amount to an outright transfer of capital.
- 2) *Asset Injections.* Provincial and municipal governments transfer assets, such as toll roads and toll bridges, to their SOEs at prices far below market value or replacement costs.
- 3) *Subsidized Inputs.* Provincial and municipal governments subsidize purchases of equipment, component parts, raw materials, and supplies for SOEs by requiring other SOEs or pressuring their own suppliers to provide these inputs at below-market or even below-cost prices.
- 4) *Tax Breaks.* Provincial and municipal governments provide tax breaks of various types to their own SOEs. Tax breaks include reduced utility costs, reduced income-based taxes, and reduced general taxes.
- 5) *Energy Subsidies.* Provincial and municipal governments sell energy and other utilities to their SOEs at below-market prices.
- 6) *Land Subsidies.* Provincial and municipal governments consolidate land parcels and sell them to their SOEs at below-market prices.
- 7) *Purchasing SOE Products.* Provincial and municipal governments purchase goods and services from their SOEs at above-market prices, often higher than less well-connected companies’ lower bids.

A 2006 European Union report noted these advantages: “China has channeled significant subsidies to favored national industries, in particular companies destined to become national or regional champions. These companies also have benefited from preferential policies such as privileged access to the banking sector. In some cases, such as the automotive and steel sectors, whole sectors benefit from an integrated industrial policy intended to support domestic production and boost exports. China also has developed a taxation system granting tax preferences contingent on the use of local

content or export performance.”⁹⁵ An article in the *China Business Review's* November-December 2006 edition listed auto, steel, energy, financial services, telecommunications, and information technology sectors as strategic sectors “where barriers to access are already being erected.”⁹⁶ During a recent fact-finding trip to China, Commissioners learned how industrial planners in Liaoning province are using these tactics to develop the local economy:

**Case Study of a Chinese Province's Economic
Development Efforts, Partially Dependent on the Role of
SOEs and the Application of Various Government
Subsidies: Liaoning Province**

In April 2007, members of the Commission traveled to China to directly assess Sino-American economic and security relations and other issues related to the Commission's mandate. During the trip the delegation visited the cities of Dalian, Anshan, and Shenyang in China's northeastern province of Liaoning. While in Liaoning the Commission toured private manufacturing facilities and state-owned enterprises, and discussed the region's economic development plans with local officials and business executives.

The Commission learned that businesses in the area have modified their practices and growth strategies to take advantage of Dalian's port location and new trade promotion policies. For example, the delegation visited Brilliance (Huachen) Auto Company in Shenyang, a majority state-owned firm that once manufactured solely for domestic markets but now produces high-end sedans for export to Europe. Upon final assembly these sedans are transported from the factory to Dalian's newly constructed Auto Terminal where they are loaded onto ships at a government owned facility with a capacity of 750,000 automobiles per year. Access to this facility has expanded the ability of firms like Brilliance to export their products.

The Commission learned that other incentives in addition to the auto loading facility are offered by the government to promote the growth of exporting companies. For instance, the Dalian Free Trade Zone manages a new bonded port area that will become fully operational by the end of 2007. The central government has identified three of the new container terminals and their surrounding areas as bonded ports that are outside the administration of Chinese customs officials. Once domestic cargo enters one of these areas, it instantly will be considered exported and domestic producers will be able to claim a tax rebate for their exported goods.

Case Study of a Chinese Province's Economic Development Efforts, Partially Dependent on the Role of SOEs and the Application of Various Government Subsidies: Liaoning Province—Continued

The delegation also toured the facilities of two state-owned enterprises in the region: an iron and steel factory and an oil refinery. The Anshan Iron and Steel Group Corporation is the second largest steel producer in China and produces pipes, rails, containers, and automobile frames. PetroChina Fushun Petrochemical Company (PFPC) produces gasoline, industrial chemicals, and waxes for export. Both firms fall within sectors considered strategic by the Chinese government and both are heavily influenced by Beijing's industrial policies. In fact, in PetroChina's English language brochure, the firm proudly boasts that "PFPC will fulfill the target of '1145' during 'the eleventh Five-Year Plan,' i.e. 11.5 million t/a⁹⁷ refining capabilities, 1 million t/a ethylene production capacity and four world level petrochemical raw material production bases ... and reach a goal of more than 50 billion renminbi in sales income."⁹⁸

Dalian is seeking to acquire a reputation as a center for high-technology development and is establishing software parks to attract businesses. While preparing for its visit, the Commission learned that Dalian was offering various financial incentives as part of its strategy to attract foreign and domestic investment. This policy was well received by U.S. firms in Silicon Valley that may be interested in doing business in China. Just before the Commission left for China, the Intel Corporation announced it had signed a deal with Dalian to build a massive \$2.5 billion chip fabrication facility there, a big win for Dalian and for a nation committed to advancing its economy's high-tech, knowledge-intensive industries. It is estimated that Intel negotiated nearly \$1 billion in financial incentives from the Chinese government.⁹⁹ Had the new facility been built in the United States, new jobs and increased high-tech production capacity would have been created domestically.

The Impact on American Firms

SOEs have distinct advantages when competing internationally and within their home market. In addition to the several varieties of subsidies that SOEs enjoy, indigenous companies benefit from sympathetic government regulators. The competitive challenge SOEs pose for U.S. companies in those sectors singled out by SASAC soon may intensify, particularly in third country markets worldwide. Beijing has announced that its ultimate goal is eventually to create "80 to 100 globally-competitive (state-owned) corporations."¹⁰⁰

According to the official *People's Daily Online*, in 2003 14 Chinese SOEs nudged their way into the Fortune Global 500, compared to just three in 1998.¹⁰¹ In 2005 that number rose to 19.¹⁰² One expert testified before the Committee on Ways and Means of

the U.S. House of Representative that SASAC hopes China will have 30 to 50 globally competitive firms by 2010.¹⁰³

Case Study: Steel

China's steel policy shows how state ownership and control combined with extensive government subsidies can threaten a U.S. industry—in this case, one that is vital to both civilian and military manufacturing. Beijing has adopted an explicit industrial policy to support steel production using a wide variety of subsidies. The consequence has been a dramatic increase in steel output in China, so far exceeding even China's skyrocketing domestic steel consumption that huge overcapacity has resulted.

In just four years, China transformed itself from a large steel importer to a large steel exporter by adding capacity at a record rate. In 2002, imports of iron and steel in China exceeded exports by 450 percent; by 2006, exports of iron and steel from China exceeded imports by 230 percent.¹⁰⁴ As a result, China now produces 35 percent of the world's steel. According to the American Iron and Steel Institute (AISI), "Chinese crude steel production more than quadrupled in the last ten years, growing from an estimated 100 million metric tons in [1996] to approximately 420 million metric tons in 2006 ... [,which is] the rough equivalent of building three entire American steel industries in one decade."¹⁰⁵

China's steel industry remains largely state-owned and controlled. Nine of the 10 largest producers in China are state-owned, accounting for 57 percent of total Chinese production.¹⁰⁶ China is now a larger steel producer than the next three producers combined: the United States, Japan, and Russia.

When the Chinese government decides how much of a good to produce, and subsidizes the production, the discipline of the marketplace no longer holds. Government-run industries continue to produce despite the rise in supply and the fall in price, which in a market-driven economy would signal producers to cut back on shifts or hours in order to minimize financial losses. But in a government command sector of the economy such as China's steel industry, prices can keep falling because a glut on the market is not rectified by natural economic forces. Those falling prices can harm workers and industry sectors in nations that do not provide huge government subsidies.

The U.S. steel industry is imperiled. AISI figures show that in 2006, China shipped over five million net tons of steel products to the United States, more than double the level of imports from China in 2005.¹⁰⁷ Although steel exports from China have declined somewhat from their peaks in 2006, the long-run threat from China's overcapacity remains. "On level terms, [the U.S. steel industry] can compete with steel industries anywhere, but we simply cannot compete against the ... government of China,"¹⁰⁸ according to Barry Solarz, AISI Vice President.

China's Foreign Exchange Reserves

Over the last several decades the Chinese have accumulated an enormous stockpile of foreign exchange reserves. A fixed exchange rate and an ever-growing export sector have worked in tandem to accumulate excess foreign currency valued by the People's Bank of China at \$1.43 trillion as of October 2007. In 2006 China's reserves of \$1.2 trillion surpassed Japan's to become the world's largest. These numbers are likely to continue to grow at a rate of \$300 to \$400 billion a year¹⁰⁹ if Beijing persists in refusing to ease its capital controls and allow market forces to determine its currency's value or reverse its export-oriented growth strategy.

To date, the vast majority of these reserves have been managed by China's State Administration of Foreign Exchange (SAFE). This agency has tended to invest the currency in low-risk, low-yield debt investments. Most estimates show 70 percent of the reserves are invested in U.S. corporate bonds, government backed securities, and treasury bills¹¹⁰—meaning that China has roughly \$1 trillion invested in U.S. securities, mainly bonds. China currently is the largest purchaser of U.S. Treasury securities.

Until recently, Beijing seems to have been satisfied with concentrating its dollar investments overwhelmingly in U.S. debt instruments. China announced in March 2007 that it intends to diversify some of its reserves by moving them out of U.S. debt securities and into higher yielding investments—presumably equities—through a new investment institution. Many of the details surrounding the new institution—the China Investment Corporation (CIC)—remain unclear. The new fund initially was allotted \$200 billion dollars,¹¹¹ but details surrounding its eventual size, what its processes will be for determining where it will invest, and what its investment criteria and priorities will be remain unclear. The Chinese official chosen to run the fund, former Deputy Minister of Finance Lou Jiwei, has said little about the structure of the fund or its future investment plans.

The methods and goals China will employ to diversify its unprecedented hoard of dollars have prompted great interest on Wall Street and in other international financial capitals for a number of reasons, including the fact that movement of such sums in and out of investments can roil financial markets. Concern in the United States focuses on the fact that China's government is the single largest actor in the foreign exchange market and the single largest buyer of U.S. debt instruments. Many financial companies will be interested in capturing the transaction fees associated with these new trades.

The CIC could be modeled after similar sovereign wealth funds (SWF) run by the governments of Singapore and Norway. These institutions invest a portion of their nations' foreign exchange holdings in foreign equities and domestic investments with higher yields than the government bonds in which SAFE has invested. Singapore's Government Investment Corporation manages roughly \$100 billion while Norway's State Pension Fund manages roughly \$300 billion. In Singapore, the institution also acts as a holding company, housing many of that nation's SOEs. It is unclear whether China will make similar arrangements and transfer certain

SASAC assets to CIC, but Singapore's success may encourage such a move.

China's pool of dollars is growing ever larger. Dr. Brad Setser, senior economist at Roubini Global Economics, estimated that by 2010, on the current trajectory, the various state entities that manage China's external assets will hold \$3 trillion.¹¹² Dr. Setser argues that the immense growth of China's foreign exchange reserves makes it inevitable that China increasingly will diversify its portfolio into equities and warns that the switch will generate friction. "I think it is quite possible that, as a result of those frictions, [for] what so far has been a very stable and not terribly volatile process for financing the U.S. external deficit, the level of volatility and friction will rise, and that could at some point generate less benign outcomes associated with our large deficit than we've seen to date."¹¹³

Not only is the investment strategy of great interest to the markets, but also there is great interest in what China's goals will be for such investment. Thus far, the best known CIC investment is the \$3 billion stake it took in the New York-based private equity firm The Blackstone Group. Some worry that the new fund may be used to capture more than China's fair share of natural resources, to bolster the international competitiveness of Chinese SOEs, or to capture advanced technology by acquiring foreign IT or other technology companies outright. Regardless of China's intentions, its activities will be closely watched as "China could be in the top four outward investors in the next five years . . . just behind the United States, the [United Kingdom], and Japan. . . ."¹¹⁴ Indeed, with the world's largest pool of foreign currency holdings, China could purchase nearly eight percent of all the 2,249 U.S. companies listed on the New York Stock Exchange, worth a cumulative \$15.5 trillion.

The China Model, the WTO, and American Responses

The world is no stranger to centrally-planned economies. In East Asia, in particular, several nations have used government industrial policies since the end of World War II in an attempt to accelerate their economic development. These have included, most notably, Japan, Taiwan, and South Korea. The key differences between what those nations did and what China currently is doing are the sheer size and scope of the Chinese model and the nature of the Chinese government.¹¹⁵ For these reasons, China's policies will have a much larger impact on the international community.

The general theme of China's 11th Five-Year Plan¹¹⁶ is to further strengthen China's industrial sectors and foster the growth of a more highly-developed, knowledge-based economy. According to Dr. Naughton, the plan states that "the Chinese government is now going to substantially step up the amount of money . . . it invests in research and development, [and] it's going to substantially step up the activity of the government in using procurement to foster a high-technology sector in China and . . . the flow of resources from the government to subsidize credit through the policy bank system¹¹⁷ in particular."¹¹⁸

While the WTO says nothing specifically about the legality of SOEs and state-directed development, it does have strict rules on

the use of subsidies intended to influence trade. China still uses illegal export subsidies and import substitution to further its industrial policies.¹¹⁹ China's own 2006 report to the WTO on its remaining subsidies, and the subsequent U.S. complaint to the WTO in 2007 on those subsidies, provide a detailed record.¹²⁰

The Chinese have a very different view than other members of what they are expected to do as a WTO member. They cite the examples of Korea, Taiwan, and Japan—all fellow WTO members. Says Mr. Clyde Prestowitz, President of the Economic Strategy Institute, who long has studied the efforts of governments to enhance their competitiveness through industrial policy: “We can argue that elements of this game are at variance with the rules of the WTO, and I believe they are, but we’ve never challenged that. We’ve never challenged [that] in the case of Japan or Korea or Taiwan or Israel or Ireland or any of the other guys who play this game. And so, [based on] precedent, the Chinese are in a position to argue . . . ‘What are you talking about? . . . We’re just doing what people do when they’re trying to develop their economies.’”¹²¹

Nevertheless, the United States does have some tools with which to defend itself. The United States brought a case before the WTO’s dispute panel in early 2007 charging that China employs illegal subsidies, although not directly linking the issue to China’s SOEs. No decision has yet been reached in that case.

Another possible remedy is the use of countervailing duties (CVDs), rather than a lengthy WTO case, to counteract subsidies, according to Mr. Thomas Howell, an attorney at Dewey Ballantine.”¹²² In October 2007, the U.S. Department of Commerce cleared the way for such an approach by determining that it would be justified in applying antidumping and anti-subsidy CVDs on Chinese glossy paper exports to the United States. In doing so, the Department also ruled for the first time that it is able to determine the extent of subsidies from the Chinese government to a favored industry—in this case, paper production. This final ruling marked the first application of the CVD law against a non-market economy since the mid-1980s.¹²³ China has responded by formally requesting, through the WTO, consultations with the United States over the decision, which is the first step in bringing a formal complaint to be adjudicated by the organization.¹²⁴ China also has held open the possibility of bringing the issue before the U.S. courts.

As other U.S. industries have been preparing similar CVD cases against Chinese competitors, both houses of Congress began considering legislation that would allow CVD cases to be brought against non-market economies. The prospects for enactment of such legislation are unclear.

Conclusions

- The push for reform in China’s economy in the 1980s and 1990s appears in some cases to have reversed with a renewed use of industrial policies combined with a new class of super state-owned enterprises.
- China’s 11th Five-Year Plan emphasizes industrial policy planning for the state-owned sector. The plan heavily promotes the development of value-added industries of a technical nature. The

Chinese Communist Party employs a range of tools to accomplish these goals, including the use of subsidies and state-funded R&D centers, promoting foreign direct investment from Western high-tech firms, employing strategies to maximize technology transfers from more-developed economies, infant-industry protection, and directed use of China's state-owned enterprises.

- China's state-owned sector is evolving in a way that challenges American firms. The Chinese government provides state-owned enterprises a combination of subsidies, access to cheap capital, industrial coordination, and foreign policy support that U.S. firms do not have.
- China's consolidation of its state-owned enterprises (SOEs) is guided by a new policy announced in December 2006. The State-Owned Assets Supervision and Administration Commission (SASAC) and China's State Council identified seven strategic industries in which the state must maintain "absolute control through state-owned enterprises," and five heavyweight industries in which the state will remain heavily involved. The strategic industries are armaments, power generation and distribution, oil and petrochemicals, telecommunications, coal, civil aviation, and shipping. The heavyweights are machinery; automobiles; information technology; construction; and iron, steel, and non-ferrous metals. It is estimated that forty to fifty of SASAC's 155 central SOEs fall in the strategic category and account for 75 percent of SASAC's total assets.¹²⁵
- China has created a new institution to invest part of its \$1.43 trillion foreign exchange holdings. The new sovereign wealth fund, managed by the China Investment Corporation (CIC), initially has been allotted \$200 billion to invest, according to some estimates.¹²⁶ It is expected that the fund will diversify by exchanging some investments in American debt securities for investments in international equity markets. Recently the CIC purchased a \$3 billion stake in the private equity firm The Blackstone Group.
- China's economic policies violate the spirit and the letter of World Trade Organization membership requirements. The United States is not limited to countering China's industrial policy tactics through the WTO, however. It can use other WTO-sanctioned trade remedies to protect itself, such as Countervailing Duties (CVDs) and antidumping cases.

SECTION 3: THE IMPACT OF TRADE WITH CHINA ON THE U.S. DEFENSE INDUSTRIAL BASE

“The Commission shall investigate and report on—

“WORLD TRADE ORGANIZATION COMPLIANCE—The compliance of the People’s Republic of China with its accession agreement to the World Trade Organization.

“ECONOMIC TRANSFERS—The qualitative and quantitative nature of the transfer of United States production activities to the People’s Republic of China, including the relocation of high technology, manufacturing, and research and development facilities, the impact of such transfers on United States national security, the adequacy of United States export control laws, and the effect of such transfers on United States economic security and employment.”

Changes in the U.S. Defense Industrial Base

During the past two decades, the U.S. defense industrial base has undergone three significant changes: A substantial reduction and redirection of defense expenditures in the period immediately following the end of the Cold War; effects from the dramatic expansion of globalization including increased reliance on imported components and end items in defense applications; and halting the reliance by the U.S. Department of Defense (DoD) on a dedicated, exclusive development and production pipeline for its military weapons and materiel.

During the Cold War, co-production with foreign defense companies often was a means of integrating American systems and components with those of U.S. allies, and served as a mechanism for strengthening alliances and ensuring inter-alliance standardization and interoperability. Still, manufacturing of American defense articles was located predominantly in the United States, creating weapon systems with high, if not total, domestic content. Policymakers believed this offered the greatest possible assurance that U.S. defense systems would be reliable and superior to those of other nations, notably the Soviet Union. The higher costs of this approach were considered to be acceptable trade offs for the benefits, one of which was the establishment of a strong and productive indigenous defense industrial base that was able to develop and field the weapons and other equipment that constituted an effective deterrent to the Soviets.

One of the characteristics of this model was that the Pentagon created its own specifications for a wide range of items used by the nation's military forces. This extended well beyond weapon systems, to include such disparate items as field rations with sufficient calories to sustain a combat soldier on the battlefield and communications gear able to withstand the rigors of aerial combat. Policymakers of the time believed such needs could not be fully satisfied with commercial off-the-shelf (COTS) components. The military's specifications ("mil specs") had the additional effect of supporting a strong domestic defense industrial base in the United States.

When the Cold War ended, U.S. defense budgets were trimmed substantially in constant purchasing power. The defense industrial base absorbed much of the effect of this major redirection, and reduced its workforce and its aggregate physical plant. During the same period, major businesses, including defense firms, began to employ some of the same business practices being used by successful commercial firms in an increasingly globalized economy: they began to procure parts and components wherever they could be obtained at the lowest costs. More and more frequently this led to off-shore sources. When it did, the subcontractors and other suppliers in the United States whose businesses had depended on contracts from the major defense manufacturers and prime contractors found it difficult or impossible to survive. This, too, resulted in diminution of the once-massive U.S. defense industrial base.

The following table illustrates how U.S. defense spending fell in the years between 1990 and 2000 (and then, accelerating dramatically between 2000 and 2005—a 48 percent increase during that period—transformed the reductions of earlier years into a gain of almost 11 percent for the entire period of 1990 to 2005). It compares the U.S. experience during this fifteen-year period with the changes in the defense budgets for eight other key nations including China, and provides world totals.

	1990	1995	Percent Change from 1990	2000	Percent Change from 1990	2005	Percent Change from 1990
United States	431,282	336,635	-21.9	322,309	-25.3	478,177	10.9
France	50,040	46,089	-7.9	43,797	-12.5	46,150	-7.8
Germany	51,160	37,852	-26.0	36,021	-29.6	33,287	-35.2
United Kingdom	51,479	43,101	-16.3	40,533	-21.3	48,305	-6.2
China	12,300 (est.)	14,000 (est.)	13.8	22,200 (est.)	80.5	37,700 (2004 est.)	206.5
India	10,533	10,983	4.3	15,487	47.0	20,443	94.0
Israel	7,677	7,809	1.7	9,330	21.5	9,579	24.8
Japan	37,668	40,483	7.5	41,755	10.9	42,081	11.7

Table 1.3 Comparative Defense Budgets 1990–2005 ¹²⁷ In millions of U.S.\$ (all figures adjusted to constant 2003 prices)—Continued							
	1990	1995	Percent Change from 1990	2000	Percent Change from 1990	2005	Percent Change from 1990
Russia	126,400	16,000	– 87.3	14,100	– 88.8	21,000	– 83.4
World	1,003,000	768,000	– 23.4	784,000	– 21.8	1,001,000	– 0.2

Exchange rates utilized are specific for each calendar year.

During this same period, three realities drove the Pentagon to move away from its long-standing, predominant reliance on “mil specs” and toward greater use of COTS procurement:¹²⁸

1. The costs of a totally separate research and development (R&D) process dedicated to weapons and military equipment, plus the costs of a totally separate supply chain for those weapons and equipment that was necessary to manufacture mil-spec parts and components that were neither needed nor used for commercial purposes, were so high they could not be supported in the post-Cold War era of smaller defense budgets.
2. Military planners knew that, increasingly, U.S. forces would derive critical advantage from their ability to integrate and effectively utilize high technology in their war fighting, and that it would be this “edge” that would be crucial to realize military victories with acceptable casualty and other costs. High technology increasingly was employed in all weapon systems and in myriad support functions. Further, the United States sought and found military advantage in greatly expanded and enhanced command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) activities, all of which were fundamentally dependent on extensive and integrated high technology. The dedicated defense R&D processes were incapable of satisfying this rapidly expanding universe of defense high-technology product needs, and the only way the U.S. military could satisfy them was to tap the cutting-edge products of the prolific commercial marketplace—either as complete systems or as components of specialized military systems.
3. Military systems dependent on high technology are subject to the same patterns and pace of obsolescence as commercial products. But the mil-spec process of system development and production proved incapable of keeping pace as anticipated product life spans grew ever shorter. In a growing number of cases planners projected that the mil-spec product development and production process would not place weapons or equipment in the operational inventory until after the items were obsolete. Even in circumstances where cost was no object, this reality forced DoD to begin using COTS components and subsystems in the weapons and equipment it procures and, in some cases, to procure and utilize complete COTS systems.

Because using COTS components in defense systems is faster, more efficient, and less expensive in most cases, it now is the rare exception when there is a separate supply chain for a defense-related product. Generally, defense-related products now emerge from the same supply chains from which civilian commercial products emanate.

Deputy Under Secretary of Defense for Industrial Policy William C. Greenwalt testified to the Commission:

[T]he Commissioners may ask ... why are we buying commercial items at all? Can't we insulate ourselves from commercial supply chain globalization trends? I believe that we cannot affordably do so. Globalization of supply chains is the reality of the 21st century and the Department has to develop a strategy to reap the benefits of this globalization and mitigate the risks.¹²⁹

Deputy Under Secretary Greenwalt further noted that, as production trends continue to move supply chains across the globe, DoD will continue to develop policies that aim to reap the benefits of globalization, including cost reduction, while seeking to mitigate attendant risks to national security.¹³⁰ Deputy Under Secretary Greenwalt said that while it would be better for the U.S. defense industrial base if DoD could influence the companies to retain their supply chains in the United States, DoD is, in fact, too small a customer of many of these companies to wield sufficient influence to accomplish this.¹³¹

In his testimony to the Commission, Mr. William Hawkins, Senior Fellow at the U.S. Business and Industry Council, confirmed that although reliance on COTS items is not new for DoD, it is a growing trend:

Since the 1980s, defense policymakers have encouraged the use of more and more commercial off-the-shelf or "dual use" components and products in military systems, largely because of their growing ubiquity in these systems and because innovation appeared to be proceeding faster in civilian industries than in defense-specific industries. This is not as new a situation as is often supposed.¹³²

The Impact of U.S.-China Trade on Sourcing of Defense Components, on the U.S. Defense Industrial Base, and on U.S. Security

During the past two decades, China's economy has grown (as documented in the other sections of this chapter). Beginning with cost advantages attributable to a host of factors (its low wage base, the absence of many social programs and supports available to U.S. workers, refusal to recognize workers' rights, failure to establish and adhere to environmental standards, etc.), manufacturers in China have been able to wrest sales from firms in the United States. This has resulted in the creation of a cycle in which many U.S. companies wanting to remain profitable have concluded they either must move their own manufacturing operations to China or halt their manufacturing operations and purchase parts and com-

ponents, and sometimes assembled products, made in China by other firms.

In some industries, reliance on China as the source of products or of parts and components is high—indeed, in some cases that reliance is complete. However, because U.S. policymakers see China as a possible strategic rival, DoD has established policies, as Deputy Under Secretary Greenwalt told Commissioners, that prohibit purchase from China of items with a significant military purpose. He also noted that broader statutory prohibitions, such as the Buy America Act, prevent DoD from directly acquiring many Chinese commercial items.¹³³

Mr. Hawkins noted in his comments to the Commission, however, that as China's share of global manufacturing continues to increase, the American defense industrial base could become more reliant on Chinese components, and this might occur largely without the knowledge of policymakers. In fact, the Pentagon does not know how extensive this problem currently is because it does not keep track of the origin of many components of the weapon systems and other materiel it procures. Mr. Hawkins told the Commission that even the few government reports that have been released in recent years tracking the trend have failed to examine sub-tier suppliers and those reports that do look beyond the end-user level only examine a very small number of weapon systems.¹³⁴

Deputy Under Secretary Greenwalt acknowledged that the potential exists for DoD unknowingly to acquire COTS items that have Chinese components:

[W]e are prohibited by law from incorporating Chinese munitions items at any tier in the contracting process. There is, however, the potential of buying commercial products that incorporate Chinese parts at the sub-tier level from either U.S. or foreign sources [that] are statutorily exempt from the Buy America Act. . . . [T]here may be some Chinese content in commercial off-the-shelf auto parts we buy. As commercial companies set up manufacturing operations in China, it is possible that some of these products will turn up in the DoD supply chain. If they do, DoD needs to do the risk/benefit analysis necessary to ensure that these products do not pose any national security risk through, for example, tampering, and then to mitigate those risks if necessary. My biggest concern for the future is in the microelectronics area.¹³⁵

The difficulty of maintaining an accurate awareness of the scope of this problem appears likely to grow in the future. According to Mr. Hawkins, the major U.S. defense contractors are moving away from manufacturing and toward the role of systems integration, which compounds the task of tracking the origin of the components they assemble:

[T]he trends don't look good here because our prime defense contractors are finally becoming systems integrators. They outsource most everything to somebody else and they're looking more and more to putting more emphasis on overseas partners. . . . [W]e know that the real trend in supply chains is to Asia, and China is getting a larger share of

that everyday. An April IMF report in microelectronics ... says that China is taking a larger and larger market share globally of that industry. So if we're going to go down that route of off-the-shelf technology and foreign purchasing, then China is going to be in the mix if we don't keep a sharp eye out for it.¹³⁶

The Risks of Reliance on Foreign-Made Parts and Components in Sensitive Applications

Security risks resulting from tampering with or specially engineering foreign-manufactured parts and components are, of course, only one of the risks of using such parts and components in defense applications. Arguably a more likely problem is the reliability of such products, which may not be subject to the same rigorous production or testing standards that apply in the United States, or where manufacturers may not have the same set of incentives to produce quality products (such as the degree of probability they will be held liable, and forced to pay a substantial penalty, for product failure).

Further, outsourcing or moving portions of U.S. defense supply chains to China or other countries may risk the security of those supply chains and therefore the availability of the weapons and other equipment that depend on them, particularly when supply surges are necessary or while the U.S. is engaged in conflict with a supplying nation or one of its allies. The supply of foreign-manufactured parts and components is far more easily interrupted by acts of nature or national governments than the supply of domestically-manufactured parts and components. Reliance on foreign-produced parts, and inability to meet needs for them from alternative sources on a timely basis, threaten failure in whatever activities depend on the items that, in turn, depend on those parts for their operation.

The Costs to the Defense Industrial Base of Outsourcing Defense Manufacturing to China and Elsewhere: Loss of the Manufacturing Facilities and of Uniquely Skilled Labor

As American companies have either shut down operations in the United States or moved manufacturing overseas, or both, companies have reduced their domestic capacity and lost some of their American workforce. Both have had immediate economic impacts stretching well beyond effects on defense capability and readiness, and even the ability to surge production when necessary.

The workforce loss is of particular concern with respect to workers with unique skills in such fields as tooling, shipbuilding, and aircraft and submarine production.¹³⁷ These skills are highly specialized, requiring unique training and industry know-how. Some of the skills involved are so specialized and precise that it takes workers not months but a number of years to acquire them through both concentrated training programs and on-the-job apprenticeship. Manufacturing downsizing attributable to offshoring has resulted in fewer Americans being trained in these fields, leaving a skills gap as the aging defense manufacturing workforce moves toward retirement.¹³⁸ Testifying before the Commission, Mr. Owen

Herrnstadt, Director of Trade and Globalization for the International Association of Machinists and Aerospace Workers, noted this trend:

[W]hat was once a drip maybe 50 years ago has turned into a tidal wave, as literally three million manufacturing jobs have disappeared from our shores in the last few years. . . . And as these jobs disappear, more and more industry, particularly manufacturing industry, is gaining steam in countries like China. . . . We need to develop and implement comprehensive solutions and do it in a timely fashion. . . . We need [also] to look at building skills—[establishing] skills schools to replace the skills that are being lost . . . on a daily basis by our own U.S. defense workers as the aging workforce grows and new workers are unable to enter the market because those new jobs aren't there.¹³⁹

Possible Relaxation of Prohibitions of Defense-related Acquisition from China

Despite these concerns, DoD is considering relaxing the prohibitions on obtaining defense components from China other than those found in COTS items. Deputy Assistant Secretary of the Army for Policy and Procurement Tina Ballard testified before the Commission that the Army is considering purchasing the rocket and missile propellant butanetriol trinitrate from China that is used in weapons such as the Hellfire missile.¹⁴⁰ With less than an 18-month supply remaining and with no American sources, the Army may need to acquire this chemical from China, according to Deputy Assistant Secretary Ballard¹⁴¹—although DoD is continuing to examine the possibility of developing an American or allied source.¹⁴²

The U.S. Defense Industrial Base Remains Strong But Vulnerable

Despite the wrenching changes it has experienced in the past 20 years, U.S. defense firms remain the most profitable in the world. Currently, seven of the top ten defense firms in the world are located in the United States.¹⁴³ The strength and size of the top American companies are in part due to the growth they enjoyed prior to the cutbacks in the mid 1990s. However, a number of them grew even during the leaner years, because they merged with and acquired other firms that were buffeted by the defense spending cuts.¹⁴⁴

The following table shows the ten U.S. defense firms with highest revenue and their ranking compared to other defense companies around the globe.

U.S. Rank	World Rank	Company	2005 Defense Revenue*	2005 Total Revenue*	Percent of Revenue from Defense
1	1	Lockheed Martin	36,465	37,213	98
2	2	Boeing	30,791	54,845	56

U.S. Rank	World Rank	Company	2005 Defense Revenue *	2005 Total Revenue *	Percent of Revenue from Defense
3	3	Northrop Grumman	23,332	30,700	76
4	5	Raytheon	18,200	21,900	83
5	6	General Dynamics	16,570	21,244	78
6	8	L-3 Communications	8,549	9,445	91
7	10	Halliburton **	7,552	20,994	36
8	12	United Technologies	6,832	42,700	16
9	13	Science Applications International Corp ***	5,400	7,792	69
10	14	General Electric ****	3,500	149,700	2

* Figures are in U.S. \$ million.

** Defense revenue from KBR Federal and Government Division.

*** For fiscal year ending 1/31.

**** Defense revenue from GE Aerospace Engines.

It is important to note while considering the revenue statistics presented in this table, however, that they provide no information whatsoever about the extent to which the products the listed American firms sell to DoD are manufactured in the United States or abroad, nor about the status or trends of their domestic manufacturing facilities or workforces. As previously noted, the major U.S. defense contractors increasingly are systems integrators that operate globally, and their revenues have no certain linkage to the health and survivability of the U.S. defense industrial base.

At the upper tiers, the leading U.S. defense companies dominate the international defense market, and can supply current U.S. requirements. There are key uncertainties regarding the future health of the defense industrial base at lower tiers, however. For two years, the Commission has tried unsuccessfully to ascertain the extent to which the industrial base relies upon Chinese components to supply critical weapon systems. Given trends in the Sino-U.S. trade relationship and the loss of manufacturing capacity in the United States, the ability of the U.S. defense industrial base to meet future U.S. military requirements is uncertain.

Research Commissioned by this Commission

In the summer of 2007, the Commission, after issuing a public request for proposals, approved a contract for a private firm to research and document the parts supply chains of three significant U.S. weapon systems: the Air Force's F/A-22 Raptor fighter/attack aircraft, the Army's UH-60 Blackhawk utility helicopter, and the Navy's new DDG-1000 Destroyer. The Commission had hoped the results of this research would be available in time to comment on them in this Report. However, the contractor has experienced considerable difficulty in obtaining access to parts and component data bases, and its initial work suggests that information beyond the secondary or tertiary levels is sparse or nonexistent.

As soon as this research is completed, the Commission will provide it and the Commission's analysis of it to interested members of Congress, and will post it on the Commission's website. This also will serve as one point of departure for further Commission investigation of this topic, which is a matter of considerable concern to its members.

The Impact of U.S.-China Trade on U.S. Research and Development

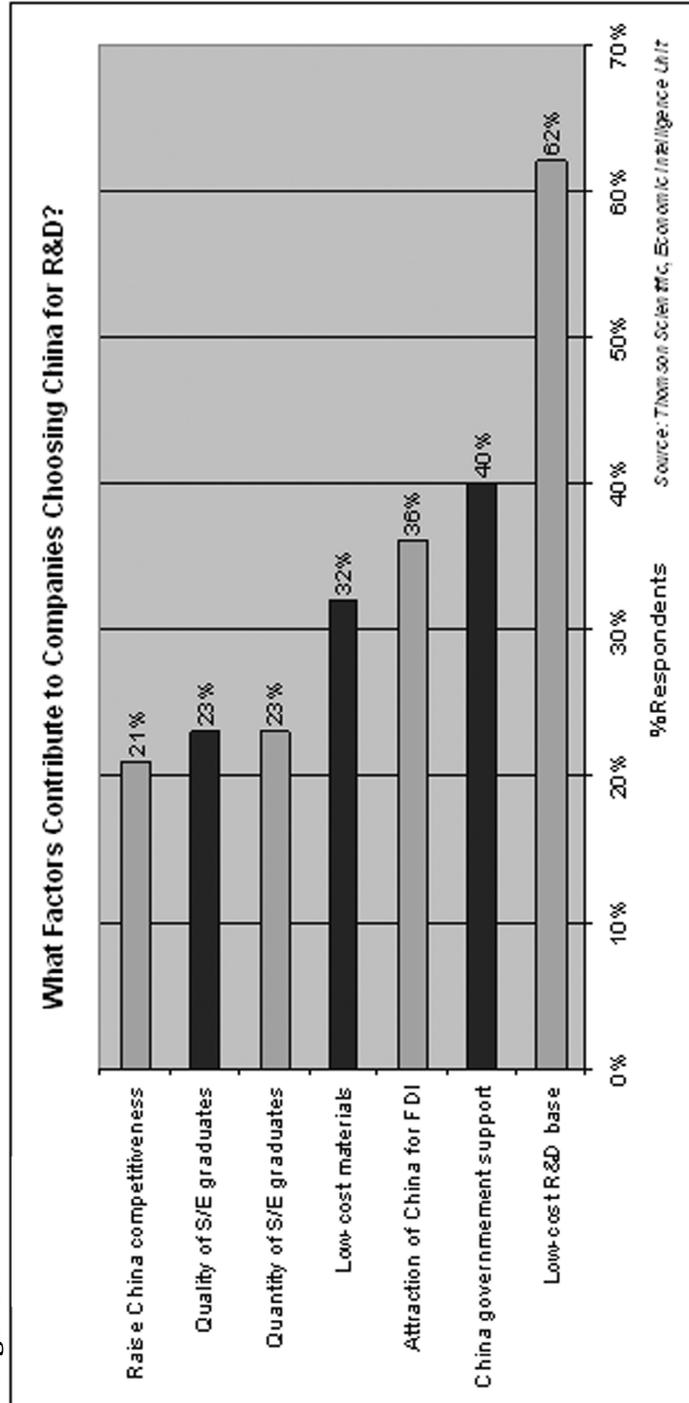
For the last 25 years, the United States has been the world leader in research and development, including R&D focused on defense applications.¹⁴⁶ While for years Japan has been second to the United States, China's R&D achievements in more recent years have been rapidly approaching those of the two leaders.¹⁴⁷ The technology China is acquiring, in part because of China's R&D achievements, is being applied to Chinese weapon systems, helping to bolster PLA capabilities. (Advances in the capabilities of the PLA are discussed further in Chapter 2, Section 1, "China's Military Modernization," and China's advances in science and technology are discussed further in Chapter 2, Section 3, "China's Science and Technology Activities and Accomplishments.")

The United States, Japan, and the European Union have averaged annual increases of 4 percent to 5 percent in R&D spending over the last 12 years, while China has increased its R&D spending an average of 17 percent annually during the same period. During the past five years, China registered annual increases of more than 20 percent.¹⁴⁸

In 2006, China's R&D expenditures surpassed those of Japan.¹⁴⁹ Expectations are that China's R&D investments will continue to surpass Japan's in coming years by large margins.¹⁵⁰ China's R&D infrastructure is showing signs of strong growth as well. From 1991 to 2002, China's industrial research workforce grew from 16 percent to 42 percent of that of the United States.¹⁵¹

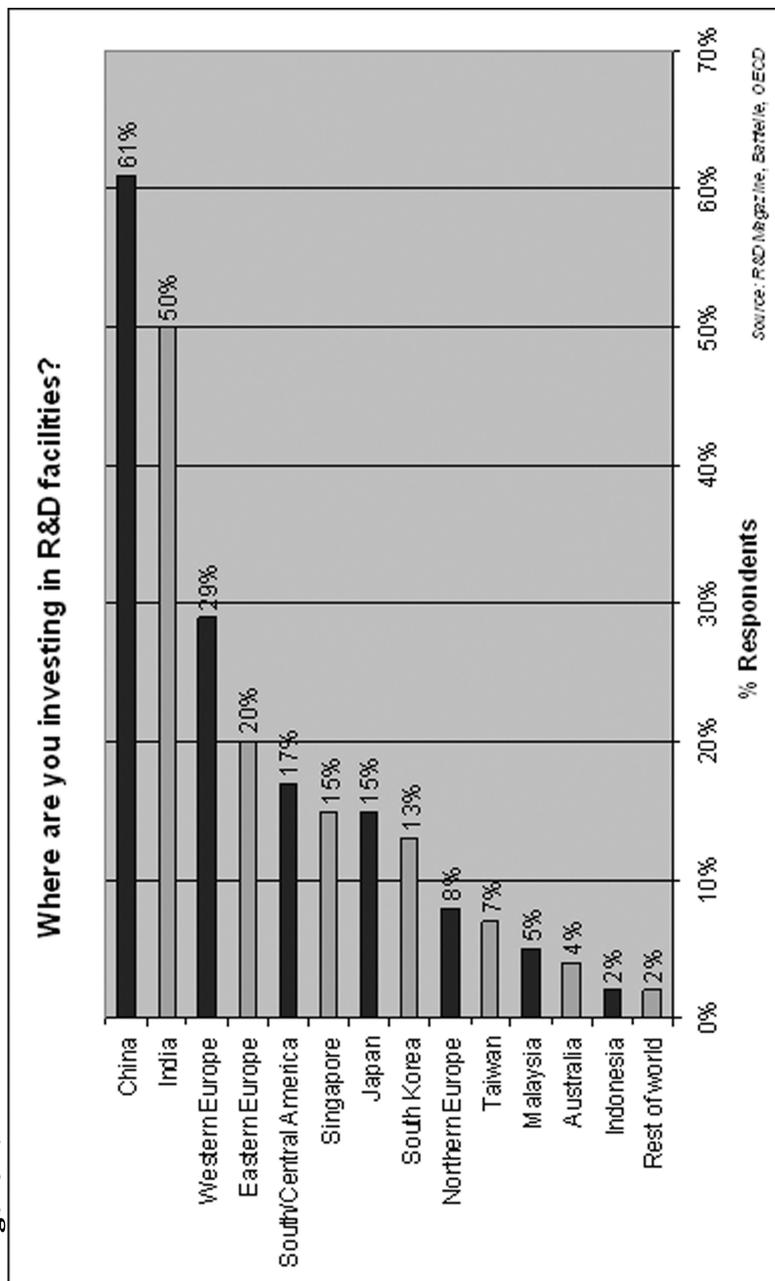
China's emergence as an increasingly capable R&D power, coupled with its low business costs, special incentives in the form of government subsidies, and lax enforcement of environmental and workplace standards, is making it an ever more attractive destination for outsourcing R&D. Recent surveys have indicated that U.S. industry is seriously considering outsourcing select segments of its R&D activities.¹⁵² India remains the premier destination for the outsourcing of computer and software R&D, but in all other sectors China is the leading choice of multinationals for R&D outsourcing.¹⁵³

Figure 1.1



Source: R&D Magazine, Global R&D Report 2007, (Northbrook, IL: September 2006), p. G4. Question originally posed to respondents: "What is China's attraction for R&D?"

Figure 1.2



Source: R&D Magazine, Global R&D Report 2007, (Northbrook, IL: September 2006), p. G4.

The question in the title of the preceding graph titled “Where are you investing in R&D facilities?” was posed to readers of *R&D Magazine*, who the magazine identifies as being primarily representatives of U.S. companies. The survey does not reflect whether the companies investing in the indicated foreign locations are or are not also investing in the United States. The table’s value is its indication of the propensity of U.S. companies to choose China over other foreign locations as a destination for their R&D investments.

Worldwide R&D spending in 2008 is expected to increase by 7.6 percent from 2007, primarily due to the rapid R&D expansion in China where such spending is expected to grow nearly 24 percent in 2008.¹⁵⁴ A recent report by *R&D Magazine* noted the R&D explosion in China:

*R&D growth continues in all geographical regions as well, although at less inflated rates than [in] China. Much of the present attention is given to the very significant growth of the offshore R&D out-sourcing practices involving activities throughout Asia—in China, India, South Korea, and Singapore. . . . There is a long history of R&D interactions among the U.S., Western Europe, and Japan. It is only in relatively recent times that the linkages have spread—and then multiplied almost exponentially—to include the rest of Asia and Eastern Europe. Current literature is replete with reports on the expanding R&D activities in China and India.*¹⁵⁵

Some factors driving this increase in R&D outsourcing include (1) the outsourcing of manufacturing that depends on on-site technical support of R&D personnel; (2) products sold in target countries that need to be modified to meet local or regional cultural, legal, and environmental standards in those countries; and (3) overseas manufacturing conditions that contain “local content” clauses that extend to the research and support of the product, and the possibility of significant labor-related cost savings for companies that utilize resident talent when R&D is outsourced.¹⁵⁵

The following charts illustrate the rapid increase of China’s share of global R&D, and the United States’ declining share—even while U.S. R&D spending continues to increase.

	GDP (PPP ¹⁵⁷) 2006 Billions U.S. \$	R&D % GDP 2006 Percent	R&D PPP 2006 Billions U.S. \$	R&D PPP 2007 Billions U.S. \$	R&D PPP 2008 Billions U.S. \$
U.S.	12,416	2.76	343.0	353.0	365.0
China	8,815	1.61	141.7	175.0	216.8
Japan	3,995	3.40	136.7	143.5	150.4
Europe	14,072	1.88	264.3	276.3	288.8

	2006	2007	2008
U.S.	32.7%	31.4%	30.1%
China	13.5%	15.6%	17.9%
Japan	13.0%	12.8%	12.4%
Europe	25.2%	24.6%	23.9%

Defense Applications of R&D in the United States

In June 2007, the Commission received briefings on U.S. defense R&D activities from each of the U.S. armed services' science and technology (S&T) units as well as from DoD's Defense Advanced Research Projects Agency (DARPA). Each gave a brief overview of its approach to R&D and some of the projects on which it has been working. Presenters from the services' units indicated that China, at present, is considered to possess significant, but not world-class S&T capabilities,¹⁵⁹ and they expressed considerable interest in building partnerships for joint research with China because those might enable U.S. defense researchers to better understand the progress Chinese researchers are making. Such partnerships, however, raise a number of serious security and intelligence concerns.

U.S. Army

The Army is striving to transform itself into a smaller and more capable fighting force. As the anticipated battlefield changes from one focused on large-scale tank assaults through the Fulda Gap to one focused on small-scale urban warfare against non-state combatants, the Army is trying to transform itself into a smaller, lighter, and more agile force.¹⁶⁰

In response to this shift, the Army is focusing its R&D efforts on such technologies as functional brain imaging, robotics, nanotechnology, quantum computing, and biotechnology. The Army utilizes a range of R&D partnerships and sources other than in-house research to perform R&D, including collaboration with universities, private industry, and foreign partners. In addition, maintaining awareness of global R&D trends and developments in S&T allows the Army to benefit from the latest technology already developed by international sources, and to identify potential partners for the co-development of next-generation technologies.¹⁶¹

The Army's Director for Research and Laboratory Management noted China's growing presence in the world's S&T landscape and told the Commission that although China is behind the United States in most fields, China is intently focused on achieving progress and has made considerable progress in both nanotechnology and biotechnology. (China's advancements in these fields are addressed in greater depth in Chapter 2, Section 3—"China's Science and Technology Activities and Accomplishments.")

U.S. Navy/U.S. Marine Corps

The U.S. Navy's Office of Naval Research (ONR) is responsible for managing the Navy's basic, applied, and advanced R&D efforts.

While recognizing that globalization threatens U.S. technical superiority and competitiveness for reasons described at the beginning of this section, the Navy sees opportunities to leverage current U.S. technological insights for future benefit.¹⁶² Currently, ONR recognizes that its knowledge of China's S&T activities is very limited, and that it is important to increase that knowledge and develop a closer relationship with China's S&T institutions.¹⁶³

The Navy maintains global technology awareness and varying levels of engagement with many countries around the globe. Yet China continues to represent a gap in the Navy's international S&T access and technological understanding. If policy concerns related to U.S.-China cooperation in some of these areas can be resolved, ONR anticipates opening an office in the U.S. Embassy in Beijing in the next two to three years.¹⁶⁴

U.S. Air Force

The Air Force Research Laboratory (AFRL) is responsible for ensuring that the Air Force is capable of maintaining global leadership in the "discovery, development, and integration" of technologies used in air, space, and cyberspace combat scenarios.¹⁶⁵ Much as the other services are adjusting their anticipated combat scenarios, the Air Force is shifting from a traditional warfare focus to preparing for non-traditional scenarios such as cyber attacks and insurgencies.¹⁶⁷

The AFRL, however, is concerned about the small percentage of American college students pursuing education in critical fields such as the sciences and engineering.¹⁶⁸ Only 17 percent of the undergraduates in the United States receive degrees in science and engineering, while over half of all undergraduates in China obtain such degrees. This trend is troubling for American researchers, as the R&D activities of U.S. companies increasingly are being moved overseas. In 1996 Chinese R&D accounted for four percent of global R&D while American R&D accounted for 38 percent. In 2006 Chinese R&D accounted for 13 percent of the world's R&D and American R&D dropped to 32 percent.¹⁶⁹

The Air Force's Asian Office of Aerospace Research and Development (AOARD) establishes and maintains R&D relationships with countries across Asia, hoping to make new S&T discoveries through collaborative efforts. Currently, AOARD has partnerships with several nations in this region including South Korea, Japan, Australia, and India, but does not have any significant joint programs with China.¹⁷⁰

Defense Advanced Research Projects Agency (DARPA)

Most defense R&D carried out by the Army, Navy, and Air Force focuses on the near- to mid-term. DARPA is responsible for the Department of Defense's mid- to long-term defense R&D.¹⁷¹ Like the R&D agencies of the services, DARPA maintains government labs and partners with universities and private industry in its research. Currently, DARPA is conducting R&D in quantum information science, new materials, power and energy, microsystems, and neuroscience, among other fields.¹⁷²

Conclusions

- As the globalization of supply chains continues, elements of the U.S. defense industrial base are being moved overseas, thus lengthening the supply chains of U.S. weapons and defense equipment. U.S. defense contractors have merged and moved some manufacturing outside the United States. Sources of defense components are becoming scarcer in the United States, and the supply of American workers skilled in manufacturing these components is diminishing.
- The U.S. Department of Defense (DoD) is not a sufficiently large customer to many of its suppliers to be able to influence their supply chain decisions.
- Some of the items DoD purchases contain foreign-made components, the origin of which, in most cases, is unknown. There potentially are substantial security risks to the United States from using foreign-made parts and components in weapon systems or other equipment important to U.S. defense. These can result from—
 - tampering with or specially engineering foreign-manufactured parts and components.
 - inadequate quality that leads to failure or substandard performance.
 - interruption of the supply chains, thus depriving U.S. forces of the weapons and equipment on which they depend to defend U.S. interests.
- At the present time, U.S. officials are neither carefully tracking the persistent attrition of the U.S. defense industrial base as more and more manufacturing is outsourced offshore, nor identifying and justifying on national security grounds an irreducible minimum defense industrial base that the United States should retain regardless of the cost or effort required to do so.
- Specifically with respect to the impact of trade with China on the U.S. defense industrial base, U.S. officials are neither—
 - methodically tracking what parts and components are obtained from China that are used in significant and/or unique systems important to the nation's defense; nor
 - identifying based on specific national security considerations (1) particular parts and components that, if obtained from China, contractors and subcontractors should be prohibited from using in any such systems, and (2) a subset of key defense systems in which contractors and subcontractors are or should be prohibited from using any parts or components from China; nor
 - developing effective means to implement, monitor adherence to, and enforce such policies and restrictions.
- The United States currently is a world leader in R&D, which greatly benefits its defense industrial base. As the quality of R&D in China continues to improve, and China's research capabilities continue to expand, it is becoming an increasingly attractive destination for American companies to outsource their R&D.

SECTION 4: A CASE STUDY OF THE LOCAL IMPACT OF TRADE WITH CHINA: NORTH CAROLINA

“The Commission shall investigate and report on—

“WORLD TRADE ORGANIZATION COMPLIANCE—The compliance of the People’s Republic of China with its accession agreement to the World Trade Organization.

“ECONOMIC TRANSFERS—The qualitative and quantitative nature of the transfer of United States production activities to the People’s Republic of China, including the relocation of high technology, manufacturing, and research and development facilities, the impact of such transfers on United States national security, the adequacy of United States export control laws, and the effect of such transfers on United States economic security and employment.”

Over the past several years, the Commission has conducted field hearings in Ohio, California, Washington, South Carolina, New York, and Michigan. The Commission chose North Carolina as the location for its 2007 field hearing because the state’s economy has been profoundly affected by trade with China, and because the state has had the collective foresight to identify and take a number of steps to assist industries and companies operating there to enhance their international competitiveness.

The Commissioners believed an examination of North Carolina’s situation would help them understand how trade with China has affected employment, wages, benefits, and communities at the local and state levels. That knowledge could be useful in understanding the effect trade with China has had on the entire nation, and the actions the United States might take to ensure the stability and prosperity of its economy as trade with China continues.

Chinese exports of textiles, clothing, and furniture to the United States have had severe effects on North Carolina’s three signature manufacturing industries. The result has been dramatic job loss, shuttered factories, and the near devastation of some rural factory towns. Yet North Carolina’s economy has survived through a mixture of planning, quick reaction, and resilience. For example, in 1959 North Carolina created one of the first and largest high technology research and development parks in the United States, the 7,000 acre Research Triangle Park (RTP). Conceived as a lure for the science and engineering graduates of the three universities that define its boundaries—Duke University, North Carolina State University, and the Chapel Hill campus of the University of North

Carolina—the research park has exceeded those initial expectations and has become a recognized, leading center for advanced research.

Today the RTP draws scientists and engineers from around the United States while it increasingly attracts foreign investment.¹⁷³ Software engineering and biotechnology were more concept than reality at the time of the RTP groundbreaking ceremonies in 1959, and no one had heard of personal computers, much less nanotechnology. Yet the RTP attracted those technologies as they emerged, and today they are prominently represented.

Although North Carolina's manufacturing job loss has been among the most severe in the nation over the past decade, its overall unemployment rate is close to the national average, thanks in part to the state's proactive record in attracting new service industries to North Carolina.¹⁷⁴

More than once, North Carolina was described during the Commission's September 6, 2007 hearing in Chapel Hill as a "microcosm" of the U.S. economy.¹⁷⁵ The job loss in manufacturing has occurred throughout the United States—some 3 million manufacturing jobs have been lost in the United States since 2000, continuing the acceleration of a decades-long trend in which jobs in the services industry have increased sharply in number and as a share of overall employment. Between 2000 and 2006, despite the loss of factory jobs, 4.3 million net jobs were created in the United States.¹⁷⁶ Similarly in North Carolina, the addition of service sector jobs there more than offset the number of manufacturing jobs the state lost.

The share of the U.S. job market represented by manufacturing has been in decline for more than fifty years, dropping from 35 percent in 1950 to below 13 percent today.¹⁷⁷ There have been many causes of national job losses in manufacturing—including increases in the productivity of workers as a result of both technological advances and large amounts of capital investment. Some jobs have been lost to international trade as plants closed or downsized. Some factories faced with import competition chose to substitute capital for labor, resulting in job loss.¹⁷⁸ In some cases, U.S.-based manufacturers have moved production offshore or have begun buying goods manufactured offshore and selling them in the United States under a brand name familiar to U.S. consumers. In such cases, U.S. job losses have been the result.

Some manufacturers argue that the decline in manufacturing employment does not necessarily mean that production also is in decline. The overall output of American manufacturing has more than doubled in the past 25 years to \$1.6 trillion, even as manufacturing employment and the overall share of the economy represented by manufacturing declined.¹⁷⁹

However, the relative role of one of the causes of the decline in manufacturing employment—foreign competition, particularly that from China—is more apparent in North Carolina than in the U.S. economy as a whole, for a variety of reasons.

The Effect of China on North Carolina's Manufacturing Economy

As late as 1995, compared to the rest of the country, North Carolina still had the highest proportion of its workforce engaged in manufacturing—23 percent.¹⁸⁰ Over the past decade, however, factory jobs in the state plummeted by 32 percent to just 553,300, down from 809,400 in 1996.¹⁸¹ Furthermore, the trend of declining manufacturing employment shows few signs of abating.

Because the services sector has been adding jobs even faster than they were lost in manufacturing, overall employment in the state has risen since 2003. However, because the services sector wage rates, benefits, and number of hours of work generally are below those in manufacturing, wage growth in North Carolina has barely exceeded inflation, and North Carolina's wages have fallen relative to other states.¹⁸² The state's per capita income fell from thirty-first among the states in 2001 to thirty-sixth in 2006—when, at \$32,234, it was 11 percent lower than the U.S. average of \$36,276.^{183 184}

A closer look at North Carolina's workforce and its unemployed workers shows why it has been so difficult for workers there to replace their former incomes. Dislocated workers are disproportionately middle-aged or older, with lower levels of education than the population as a whole; for example, 85 percent of those who lost jobs in 2003 in North Carolina had a high school diploma or less.¹⁸⁵ Both the age and educational factors complicated efforts to retrain workers who lost jobs they had held in manufacturing—workers who in most cases are many years past their last classroom instruction. Only 42 percent of North Carolina workers 55 and older who were laid off in 2002 found a new job within a year, and they earned just 61 percent of their former wages.¹⁸⁶ One-third of dislocated workers of all ages brought home less than half their previous earnings.

Laid-off workers in North Carolina also tended to be from rural areas with a strong sense of community. "The sense of place is very important to people here," according to Dr. Betty McGrath, a manager at the Employment Security Commission of North Carolina. "People don't want to leave their homes where generations of their families have lived and worked hard for years to make their companies successful. When jobs were not available in the communities in which they lived and had worked for many years, many of the laid-off workers were unable or unwilling to consider relocating to areas with greater employment prospects."¹⁸⁷ Just less than half of rural dislocated workers laid off in North Carolina in 2002 were able to find work within a year.¹⁸⁸

When displaced manufacturing workers in North Carolina found new employment, often it was in part-time work. Even if the hourly wage levels were equal—and often they were lower—such jobs obviously produce lower total wages. Also, part-time jobs seldom provide such benefits as retirement or health insurance. For example, researchers examining the fate of 4,800 workers laid off in 2003 from a group of Pillowtex textile factories in North Carolina found that 15 percent of these dislocated workers moved into an employment category of "professional and business services."¹⁸⁹ But with-

in that grouping are employers who pay no benefits and often hire workers for part time or temporary jobs. “At first glance, professional and business services sounded like a good transition, but a substantial number of those [jobs] were in temporary help agencies,” said Dr. McGrath. “[The displaced Pillowtex workers who took those jobs] most likely received no benefits.”

Women and minority dislocated workers have experienced special problems in regaining economic stability. The workers displaced by trade in North Carolina are disproportionately female, but because of family obligations they often find it more difficult than males to relocate where jobs are available. Although the rural North Carolina workforce is just 18 percent black, 42 percent of dislocated workers in rural areas are black.¹⁹⁰ Of the eight counties in which African-Americans compose 50 percent or more of the population, the unemployment rate in 2006 was 6.9 percent, compared to 4.8 percent in the state as a whole.¹⁹¹ When the displacements resulting from China trade caused the closure of many North Carolina manufacturing plants and the black workers in those plants lost their jobs, they found themselves added to the substantial pool of unemployed African-Americans for which job training and placement already had proved inadequate.

Statistics compiled by federal programs that aid manufacturing workers whose jobs are lost to imports show that North Carolina has led the nation in import-related layoffs. In fiscal year 2006, for example, of the 120,000 workers nationwide who were eligible to receive special benefits to laid-off workers who had lost their jobs as a result of import competition, a third were in North Carolina.^{192 193}

Private sector employment gains in the state were almost wholly concentrated among 131,000 new jobs in private education and health care and 61,000 new jobs in the leisure and hospitality industries. The better-paying factory jobs making textiles, clothing, and furniture were replaced by lower paying services-sector work, including jobs waiting tables, cleaning hotel rooms, and caring for hospital patients. Average compensation for employment in the manufacturing sector was 128 percent of North Carolina’s average wage in 2005 while that for health care was 91 percent and compensation in the leisure and hospitality sector was considerably lower.¹⁹⁴ For example, compensation in hotels and resorts was just 50 percent of the average statewide compensation while restaurant work paid just 34 percent of the average. Fortunately for workers in the services sector, while services work on average is not as well paid as work in manufacturing, services jobs generally are not as import sensitive as manufacturing jobs.¹⁹⁵

Why were North Carolina’s signature industries hit so hard by imports, particularly those from China? China’s admission to the World Trade Organization in 2001 is one of the reasons. By joining the WTO, China also joined those textile- and apparel-exporting WTO member nations whose 30-year-old export quotas were being phased out on textile and clothing shipments to the United States, Japan, and Europe. Had China not joined the WTO, it would have remained under the quota system known as the Multi Fiber Arrangement of 1974. In that case, China’s clothing and textile exports to the United States and elsewhere would have remained cur-

tailed by quotas, just as the rest of the world's clothing and textile exporters were freed from such quotas. Instead, China benefited from joining the WTO at the very end of a ten-year quota phase out that had begun in 1995. China quickly seized the new, unrestricted opening and became the world's dominant, vertically integrated, low-cost producer, displacing all other clothing producers including the United States.¹⁹⁶

In the first quarter after China was freed from the quotas, Chinese textile and apparel exports to the United States increased 62.5 percent overall. Some categories jumped as much as 1,500 percent.¹⁹⁷ By the time the quota phase-out was completed, the U.S. textile and apparel industry lost more than 44,000 jobs; 11,000 of those were in North Carolina.¹⁹⁸

In response to persistent complaints from U.S. industry and under the pressure of lengthening lines at unemployment offices in North Carolina and several other states, the Administration successfully pursued with Beijing an agreement to limit some categories of Chinese clothing exports to a 7.5 percent annual increase through 2008. After that date, any remaining quotas will be lifted. The temporary agreement slowed the job loss in the United States,¹⁹⁹ but job losses are likely to reaccelerate once those restrictions are lifted. China has continued to invest heavily in textile and apparel production capacity. According to National Council of Textile Organizations (NCTO) figures, during the past ten years, the Chinese textile sector purchased 65 percent of all knitting machines, 62 percent of all weaving machines, and 46 percent of all spinning machines sold in the world.²⁰⁰

According to the U.S. textile industry, China's growing dominance is due to a Chinese industrial policy that favors the textile and apparel industry in China. The NCTO identifies 73 separate subsidies the organization claims the Chinese government provides its domestic producers. (A list of these subsidies can be found in Appendix VII–A.) That figure does not include China's currency controls that the NCTO estimates provide up to a 40 percent export price discount for domestically produced clothing. The subsidies come from the central, provincial, and municipal governments. They include monetary awards for export performance; low-cost financing; preferential rates on land, water, electricity, transportation, and telecommunications; tax reductions, exemptions, and rebates; lowered administrative fees and tariffs on equipment imports; free advertising; and exemptions from mandatory worker benefit contributions.²⁰¹

The furniture industry in North Carolina also cites the artificially low value of the renminbi as well as Chinese manufacturers' frequent practice of selling their products at prices below the cost of production—known as “dumping”—as among the causes of its difficulty in competing with exports of wooden furniture from China. North Carolina is home to the nation's largest wholesale furniture market (in High Point), and has been by far the nation's largest producer of wooden household furniture. But due in great measure to exports from China of wooden furniture, often sold in the United States at artificially low prices, the North Carolina industry has been devastated.²⁰² While no quotas had restrained imports of furniture from China prior to its WTO accession, admission

to the WTO lowered the tariffs China's furniture manufacturers faced in exporting to the rest of the world, including the United States. Between 2000 and 2003, 73 furniture plants closed in North Carolina.²⁰³ Between 2000 and 2005, 18,801 workers, accounting for 28 percent of the wooden furniture industry workforce there, lost their jobs.²⁰⁴ Of the 40 largest wooden furniture manufacturers who once operated 125 woodworking plants, 80 percent have closed their factory doors, according to Mr. Wyatt Bassett, president of Vaughan-Bassett Furniture that operates a plant in Elkin, North Carolina.

The Federal Reserve Bank of Richmond sums up the importance of the furniture industry to North Carolina's manufacturing base this way:

*Furniture manufacturing has a long and storied tradition in North Carolina. From modest origins in the late 1800s, the state's furniture industry expanded during the twentieth century to rank among the largest and most prosperous in the nation. High Point, Hickory, Drexel, Thomasville, and other small North Carolina towns became focal points of the United States furniture craft during the period. And prosperity in the industry helped raise standards of living in a state that was once among the poorest in the nation. Along with textiles and tobacco processing, furniture manufacturing became symbolic of North Carolina's industrial progress and the South's efforts to spur economic development in the twentieth century.*²⁰⁵

But China's furniture exports severely damaged North Carolina's furniture industry. By 2000, China had displaced Canada as the largest exporter of furniture to the United States, despite having to ship its products halfway around the world.²⁰⁶ Shipments of Chinese wooden bedroom furniture, the predominant industry sector in North Carolina, totaled just \$200 million in 1999, according to industry figures. But in just three-and-a-half years, that figure jumped 715 percent to \$1.6 billion. China's share of the U.S. market for bedroom furniture increased from 15.6 percent to 53 percent, due largely to predatory pricing.²⁰⁷ Antidumping penalties levied in the summer of 2004 on Chinese wooden bedroom furniture then caused Chinese exports to plateau.

But the damage to the North Carolina industry already had been done. Much of the Chinese-made furniture exported to the United States is now being sold under the brand names of the U.S. companies that formerly made their own furniture in U.S.-based factories.²⁰⁸

The figures indicate one irony: if the U.S. companies making bedroom furniture were to file an antidumping petition with the U.S. Department of Commerce today, they might not meet the requirements for legal standing, because so many American manufacturers have switched to importing Chinese furniture and placing their own brands on the imports.²⁰⁹ As a result, many companies that formerly manufactured in the United States would now oppose imposition of antidumping penalties on furniture they import from China to sell under their own brand names.²¹⁰

North Carolina's Successful Efforts to Compete

Not all the most recent economic news has been bad for the Tar-heel state, however. In the 12 months ending June 2007, jobs had increased by two percent, placing North Carolina tenth among all states in job gains. Professional and business services, construction, and finance recently have joined the health and education sectors as strong gainers. The unemployment rate, at 4.8 percent, was just slightly above the national average of 4.6 percent in August 2007. Moreover, although North Carolina in July 2007 had the twenty-first worst job market in the nation in the furniture-making region of Hickory, Lenoir, and Morgantown due to layoffs there, it also could claim four of the nation's best job markets in Jacksonville (seventh best), Rocky Mount (twelfth best), Wilmington (fourteenth best), and Greenville (twenty-first best).²¹¹ Furthermore, North Carolina's share of the nation's GDP has been increasing (albeit sporadically) over the past four years and the gap between North Carolina's share of the economy and its share of the population has narrowed considerably.²¹²

North Carolina's Research Triangle Park has been cited, studied, and copied worldwide as a generator of jobs and economic prosperity, as well as an antidote to the collateral damage of globalization. In fact, China has copied the concept, and currently has ten parks that are among the world's largest, with more than 1,000 tenants each. Originally intended as a way to provide jobs for graduates of the three major universities in the area,²¹³ the RTP now attracts investors, scientists, and engineers from around the world.²¹⁴ Among the states, only California ranked higher than North Carolina in 2004 as a location where corporations were considering placing new offices and facilities.²¹⁵ More than 39,000 people work at 157 organizations located within the RTP. Their average salary is \$56,000, nearly 45 percent higher than the regional average—a sea change in an area that was once the state's poorest region.^{216 217}

During its hearing in North Carolina, the Commission heard from a representative of a highly successful company located within the region: Red Hat Software. Mr. Michel Chen, vice president of corporate marketing, told the Commission the company has 2,000 employees in 58 countries and had revenues last year of \$400 million. The company's product is unique: it supplies the customization and tech support required by users of the free, open-source Linux operating system. Half its clients/customers are in the United States, and half are outside.

Mr. Chen told Commissioners that Red Hat was founded on the premise that globalization is inevitable and, coincidentally, that it sees China, with a sixth of the world's population and a fast-growing economy, as a huge potential market and opportunity for American exports. Red Hat has offices in seven Chinese cities. When Mr. Chen was asked why Red Hat chose the Raleigh-Durham-Chapel Hill area as the location for its headquarters and has kept it there after the company's rapid global expansion, he responded:

It's the innovation, it's the idea . . . because [North Carolina has] the best technology and the best business education in the world . . . If you look at the entire economy as a supply

*chain or supply network, there are certain places that North Carolina is shining through. . . I think given the pressure from China, given the new economy, given the globalization, it's the business leaders, it's the policymakers who have to take a step back and really think through how we can really build a new economy.*²¹⁸

North Carolina's Efforts to Cushion the Blow

North Carolina has developed an innovative approach to dealing with the mass layoffs that have swept through its rural textile and furniture manufacturing hubs. Unlike layoffs in economically diversified cities, the closing of just one medium-sized factory in a small town can be devastating to the entire town as the effects ripple through the economy, closing restaurants, car lots, movie theaters, bowling alleys, and barbershops. Workers who wish to leave the area to seek other work are unable to sell their homes. The tax base of the town and county often is devastated just as their citizens need extra help from government.

North Carolina participates in joint federal-state programs that respond to major economic dislocations by supplying immediate aid in the form of temporary replacement wages, assistance in obtaining health insurance, and education and re-training. North Carolina has developed a "rapid response team" approach to distributing aid to dislocated workers, particularly in cases of plant shutdowns.

Under the joint assistance program, states may create a simplified clearinghouse of job information free of the bureaucratic red tape associated with government employment agencies. The states work to pool funds available from related programs and use them to tailor assistance to individuals in a variety of ways that may include helping dislocated workers start their own businesses, obtain child day care, enroll in classes, or otherwise ease their reentry to the workforce.

In 2003, North Carolina's rapid response was tested when Pillowtex, a large textile company that in 1997 had absorbed Fieldcrest Cannon (itself the product of a merger of two textile giants), closed abruptly and filed for Chapter 13 bankruptcy. Some 4,800 workers in North Carolina were laid off, pushing the unemployment rates in three counties to around 10 percent.²¹⁹

A North Carolina union representative at that time, Mr. Harris Raynor, currently an international vice president of UNITE HERE, remembers the layoff in vivid terms:

"It was a despicable event, and it was a very tremendous tragedy. Almost all those workers, as the papers have shown, could not afford health insurance. . . . what programs there were were totally inadequate, did not understand workers, did not understand the education level of these folks, many of whom tried to go to school, many of whom thought that they had to go to school to get the extended unemployment benefits that were there, and most of them wound up taking remedial classes because they couldn't even read well enough to take the classes that they

*needed to take in order to get degrees and do the jobs that they have.*²²⁰

The state sent teams of state aid workers to the Pillowtex sites and helped the unemployed sign up for benefits and retraining programs. The state also tracked the efforts of the workers to obtain training and reemployment. In the four years ending in July 2007, 2,417—or half-the laid-off Pillowtex workers—enrolled in North Carolina’s community college system. A little more than a third of those sought to finish high school or obtain equivalency degrees. About the same number sought associate degrees and the remainder enrolled in occupational training. By the end of 2006, only 60 percent of the workers had managed to find jobs in North Carolina. A third returned to manufacturing while the rest moved into services industry employment.

Another instance in which the assistance system was tested was the April 2006 closing of the Collins and Aikman plant in Roxboro that manufactured automobile interior fabrics. This closing made 545 workers suddenly jobless. Counseling, retraining, health insurance, housing assistance, and, eventually, job fairs were among the services offered to that plant’s former workers.²²¹

North Carolina’s 58 community colleges have been important to the state’s retraining efforts. “The key to what we do with Rapid Response is to have empathy and a heart for helping people,” said Dr. H. James Owen, President of Piedmont Community College in Roxboro since 1987. “It’s not like teaching calculus and saying, ‘Ya’ll come and get it; here it is.’ You must work very diligently with people who have worked for the same company for 20, 30, and 40 years. You must make sure they understand the options available to them.”

Today, Dr. Owen told the Commission, the college is hoping to retrain and place some of the former Collins and Aikmen workers at a new plant that will be building the Cheetah mine-resistant vehicle for the U.S. military. The new plant will employ 270. The Cheetah’s manufacturer has been interviewing prospective employees at the college’s “workforce training center.” The college also hopes to help dislocated workers obtain jobs at the \$100 million Honda Aircraft Company, Inc. headquarters under construction in Greensboro. It is expected to employ 500 new workers building light aircraft. In such cases, businesses work with the community college system to determine and arrange for the types of training that will best fit the needs of employers and their potential employees, according to Dr. Owen and Mr. Thomas White, Director of Business and Industry Services for the Division of Workforce Development of North Carolina state government’s Department of Commerce.

While the North Carolina dislocation assistance system has proven effective over the past decade, some improvements in the way the federal and state governments coordinate the available benefits could improve and expand the help that assistance system provides to dislocated workers, according to Dr. Owen. For example, the federal Trade Adjustment Assistance program requires dislocated workers to be enrolled in approved training within 13 weeks of the end of their severance pay in order for the training to be funded by the government. However, since most nursing programs accept

new students only at the beginning of the fall semester, this avenue is often closed to dislocated workers because of the narrow 13-week window. In some cases, the newly unemployed workers need more help in choosing among the many options for health insurance and more time to navigate the complexity of the Trade Adjustment Assistance program that provides benefits for those workers who lose their jobs because of imports. Even the personnel of the assistance program “sometimes find it difficult to understand,” said Dr. Owen. “This complexity inhibits clarity of communication of requirements and benefits of the program to those who are already upset and anxious about being dislocated from their livelihood.”

Conclusions

- The accelerating decline in North Carolina’s manufacturing employment is due in large measure to increasing competition from imports, mostly from China. Manufacturing employment in the United States has declined for 50 years although the dollar value of manufacturing production has increased as a result of rising productivity.
- During this same period, the number and proportion of jobs in the North Carolina services sector have been increasing. This shift has put downward pressure on wages because manufacturing historically has paid substantially higher wages than the services sector. This shift also has reduced the number of workers receiving such fringe benefits as retirement and health insurance, in part because some of the displaced workers were able to find only part-time jobs that often do not offer benefits.
- Because a greater proportion of North Carolina’s workforce held manufacturing employment than held such employment in any other state, North Carolina’s workforce was more vulnerable to competition from imports than the workforces of other states. North Carolina’s manufacturing economy was made even more vulnerable by its concentration in the import-sensitive sectors of textiles, apparel, and furniture.
- Trade agreements can profoundly affect state and regional economies and particular industries. The combination of China’s 2001 admission to the World Trade Organization (WTO), which gave it quota-free access to U.S. markets for its textile and clothing exports, and the subsequent U.S. grant of Most Favored [Trading] Nation status that lowered most tariffs on Chinese imports,²²² battered North Carolina’s textile and apparel industries, and they never recovered. While trade agreements that lower import barriers among America’s trading partners have the potential to benefit American exporters, North Carolina appears to have realized few if any substantial benefits from China’s admission to the WTO, and the net effect of trade with China since its accession appears to be negative overall for North Carolina’s economy.
- Two provisions in trade laws and agreements proved crucial to sustaining what remained of North Carolina’s textile, apparel, and furniture industries after China’s admission to the World

Trade Organization. The first authorized the U.S. Department of Commerce to levy “dumping” duties on below-cost imports of Chinese wooden bedroom furniture in July 2004. The second authorized imposition in 2005 of temporary import quotas on Chinese clothing imports.

- North Carolina has been a global leader in establishing a local base for research and science, leveraging the state’s best universities and an innovative industrial policy to fashion the 700-acre Research Triangle Park, now almost 50 years old. It has been successful by almost any measure, attracting 157 tenants and producing its own job-creating momentum. This center has enabled North Carolina to compete successfully for facilities of many companies and has substantially increased the number of higher paying jobs in the state.
- North Carolina has worked diligently to make user friendly the system of benefits for dislocated workers that has been established and funded largely by the Federal Government. This has greatly benefited its workers who have been dislocated by the effects of trade, and has helped salvage the state’s economy and place it on a firmer footing.

RECOMMENDATIONS

The Relationship's Current Status and Significant Changes During 2007

- The Commission recommends that Congress urge the Administration to press China to sign the Agreement on Government Procurement in fulfillment of a promise it made when it joined the World Trade Organization in 2001.
- The Commission recommends that Congress enact legislation to define currency manipulation as an illegal export subsidy and allow the subsidy to be taken into account when determining penalty tariffs. In addition, Congress should amend the law to allow currency manipulation to be added to other prohibited subsidies when calculating antidumping and countervailing duty penalties.
- The Commission recommends that Congress amend the 1988 law directing the U.S. Department of the Treasury to report biannually on "International Economic and Exchange Rate Policies." Congress should eliminate the requirement that the Department of the Treasury first determine whether a country intends to gain an export advantage before deciding that country has manipulated its currency.
- The Commission recommends that Congress urge the Administration to bring a World Trade Organization case against China for manipulating its currency to gain an unfair trade advantage, which is a violation of the principles of the International Monetary Fund of which China is a member.
- The Commission recommends that Congress petition the Administration to initiate a Section 301 investigation of Chinese worker rights violations in preparation for bringing a case before the World Trade Organization alleging suppression of labor rights as an unfair trade practice.

The Control of China's Economy by its Government, and the Effect on the United States

- The Commission recommends that Congress urge the Administration to employ all necessary trade remedies authorized by World Trade Organization rules, including antidumping and countervailing duty penalties and temporary relief, to protect the U.S. economy from the Chinese government's extensive subsidies for companies in China.

- The Commission recommends that Congress endorse the U.S. Department of Commerce decision that it has the authority to bring countervailing duty cases against non-market economies.

The Impact of Trade with China on the U.S. Defense Industrial Base

- The Commission recommends that Congress require the U.S. Department of Defense to prepare a complete list of the country of origin of each component in every U.S. weapon system to the bottom tier.

A Case Study of the Local Impact of Trade with China: North Carolina

- The Commission recommends that Congress increase the resources of the U.S. Department of Commerce and the Office of the U.S. Trade Representative devoted to tracking and ensuring compliance by America's trading partners with their World Trade Organization obligations.
- The Commission recommends that Congress require U.S. companies to report to the U.S. Department of Commerce their receipt of any economic subsidy from China.
- The Commission recommends that Congress revise the requirements to achieve standing under antidumping cases, particularly in cases where continuing sales losses in U.S. industries have driven producers into a minority status and they therefore are ineligible for standing.

ENDNOTES FOR CHAPTER 1

1. A single foreign bank is limited to a 20 percent stake in a Chinese bank. Total foreign ownership of a Chinese bank is limited to 25 percent.
2. Gary Clyde Hufbauer, Yee Wong, and Ketki Sheth, *U.S.-China Trade Disputes: Rising Tide, Rising Stakes*, (Institute for International Economics, Washington DC: August 2006).
3. China's openness to foreign investors is illustrated by the ratio of foreign direct investment to GDP. In China, the percentage of China's economy represented by foreign investment was 42 percent in 2004 while in Japan, the number was two percent.
4. World Trade Organization, *Trade Policy Review; People's Republic of China*, (Geneva: June 2006). www.wto.org/english/tratop_e/tpr_e/s161-0_e.doc.
5. The Commission found during its 2006 trip to China that Chinese officials in Beijing and Wuhan were conversant with the obligations that China undertook to join the WTO and that extensive efforts had been made to instruct the public through the news media and in seminars.
6. The WTO rules prohibit subsidies intended to favor exports and also require protection of intellectual property. The International Monetary Fund rules prohibit currency manipulation intended to gain an export advantage. The United States has been negotiating with China over its currency regime.
7. U.S.-China Economic and Security Review Commission, *Hearing on the U.S. China Relationship: Economics and Security in Perspective*, testimony of Peter Navarro, February 1, 2007.
8. The United States on October 15 also demanded an accounting from China for its failures to abide by its WTO commitments. The demand was part of an annual review process by the WTO of China's compliance. The United States was joined in its demand by Japan and the European Union. As part of its agreement to join the WTO in 2001, China agreed to undergo a yearly review of its trade policies.
9. U.S.-China Economic and Security Review Commission, *Hearing on The Extent of the Government's Control of China's Economy and Implications for the United States*, testimony of Barry Naughton, May 24, 2007; Barry Naughton, *The Chinese Economy, Transitions and Growth* (MIT Press, Cambridge, MA: 2007), p. 303.
10. United States Trade Representative, *2007 National Trade Estimate Report on Foreign Trade Barriers*, (Washington, DC: March 2007), p. 80.
11. U.S.-China Economic and Security Review Commission, *Hearing on the U.S. China Relationship: Economics and Security in Perspective*, testimony of Peter Navarro, February 1, 2007.
12. The Dictionary of Modern Economics, (MIT Press, Cambridge, MA: 1983) describes mercantilism as the practice of "obtaining a surplus of exports over imports" by subsidizing exports, taxing imports and adopting other policies to produce a positive trade balance at the expense of the consumer and the risk of introducing inefficiencies in the economy. The strategy, first advanced in the 18th Century, was intended to result in the accumulation of large amounts of gold and silver—the equivalent today of large amounts of foreign currency reserves.
13. David Barboza, "Trade Surplus Puts Pressure on Inflation in China," *International Herald Tribune*, October 12, 2007. www.ihf.com/articles/2007/10/12/business/yuan/php.
14. C. Fred Bergsten et al., "The China Balance Sheet in 2007 and Beyond," Peterson Institute for International Economics, p.10. www.chinabalancesheet.org.
15. Congressional Research Service, *China's Economic Conditions*, (Washington, DC: October 2007).
16. "China's Trade Surplus Swells in September," RTT News: Global Financial Newswires, October 12, 2007. www.rttnews.com/economicnews.asp?date=10/12/2007&item=12.
17. U.S. Department of the Treasury, Office of Macroeconomic Analysis, "Profile of the Economy," June 2007, p. 7. fms.treas.gov/bulletin/b2007-2poe.doc.
18. Net exports are simply exports minus imports and constitute the trade balance in goods and services. A positive number for net exports contributes to economic growth. A negative number detracts from the economy. Thus, the U.S. trade deficit subtracted 0.5 percentage point from growth in the first quarter of 2007, which was just 0.7 percent. Without the economic drag of the trade deficit, growth for the quarter would have almost doubled, to 1.2 percent.
19. The World Bank, *Quarterly Update: China*, (Washington, DC: September 2007), p. 2, siteresources.worldbank.org/CHINAEXTN/Resources/318949-1121421890573/cqu_09_07.pdf.

20. U.S. Department of the Treasury, Office of Macroeconomic Analysis, "Profile of the Economy," June, 2007. fms.treas.gov/bulletin/b2007-2poe.doc.
21. The World Bank, *Quarterly Update: China*, (Washington, DC: September 2007), p. 3, siteresources.worldbank.org/CHINAEXTN/Resources/318949-1121421890573/cqu_09_07.pdf.
22. Erin Lett and Judith Banister, "Labor Costs of Manufacturing Employees in China: an update to 2003-04" Bureau of Labor Statistics, Monthly Labor Review Online. www.bls.gov/opub/mlr/2006/11/art4exc.htm. Wages of production workers in China are not available. Production workers generally are somewhat higher paid so the two figures are not strictly comparable.
23. U.S. Department of Labor, Bureau of Labor Statistics. data.bls.gov/cgi-bin/surveymost?bls report CES0500000008.
24. U.S. Department of Labor, Bureau of Labor Statistics. data.bls.gov/cgi-bin/surveymost?bls report CES0500000008. Comparisons between the U.S. production wage and the Chinese hourly wage are not precisely comparable since the Chinese figure includes all workers, not just production workers, who receive somewhat higher pay.
25. C. Fred Bergsten et al., "China Balance Sheet—Trade Imbalance," Peterson Institute for International Economics, www.chinabalancesheet.org.
26. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of Peter Navarro, February 1, 2007. Shortly after Dr. Navarro's testimony, the office of the U.S. Trade Representative did bring formal complaint to the WTO on China's export subsidies.
27. U.S. Department of the Treasury, Office of Macroeconomic Analysis, "Profile of the Economy," June, 2007, p. 10. fms.treas.gov/bulletin/b2007-2poe.doc.
28. U.S. Department of the Treasury, Financial Management Service, "Financial Highlights." fms.treas.gov/annualreport/cs2006/finhigh.pdf.
29. Organization for Economic Cooperation and Development, "Economic Survey of China, 2005." www.oecd.org/eco/surveys/china.
30. U.S. Department of the Treasury, "The Debt to the Penny." www.treasurydirect.gov/NP/BPDLogin?application=np.
31. During the Commission's April 2007 trip to China, this explanation for America's trade deficit with China was raised by the official host, Ambassador Wang Yuxiang, who lectured the Commissioners on America's overconsumption.
32. Treasury Secretary Henry Paulson, speech to School of Advance International Studies of the Johns Hopkins University, April 16, 2007.
33. C. Fred Bergsten et al., "The China Balance Sheet," Peterson Institute for International Economics, www.chinabalancesheet.org.
34. Steven Dunaway, Deputy Director, Asia and Pacific Department, International Monetary Fund, Seminar on "China's Financial System Reforms and Governance," April 16, 2007.
35. C. Fred Bergsten et al., "The China Balance Sheet," Peterson Institute for International Economics, www.chinabalancesheet.org.
36. Chinese National Bureau of Statistics. www.stats.gov.cn. Most of the numbers used in this report are from U.S. government and U.S. private sources and estimates. However, U.S. statistical sources generally rely on figures derived from the Chinese National Bureau of Statistics.
37. Congressional Research Service, *China's Economic Conditions*, (Washington, DC: July 2007), p. 8. The Chinese government has identified major U.S. investors as Motorola, General Motors, Dell Computer, Hewlett Packard, and Kodak, all based on 2003 sales volume.
38. Federal Reserve Board Chairman Ben Bernanke, Speech at Strategic Economic Dialogue, Beijing, December, 2006.
39. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspectives*, testimony of Grant Aldonas, February 1, 2007.
40. U.S. House of Representatives Committee on Ways and Means, "Currency Manipulation and Its Effect on U.S. Businesses and Workers" May 9, 2007; U.S. Department of the Treasury, *Report to Congress on International Economic and Exchange Rate Policies*, (Washington, DC: June
41. C. Fred Bergsten et al., "The China Balance Sheet," Peterson Institute for International Economics, www.chinabalancesheet.org.
42. U.S. Department of the Treasury, *Report to Congress on International Economic and Exchange Rate Policies*, (Washington, DC: June, 2007), pp. 27-35.
43. Xin Zhiming, "Forex rules scrapped to stem liquidity," *China Daily*, July 10, 2007, 1.
44. As of 10/22/2007, the renminbi was trading at 7.51 to the dollar.

45. Section 301 of the Trade Act of 1974 authorizes USTR to investigate allegations of unfair trade practices and to determine whether those practices affect U.S. commerce.
46. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of Thea Mei Lee, February 1, 2007.
47. Office of the U.S. Trade Representative, *Statement from USTR Spokesman Regarding China Labor Petition*. www.ustr.gov/Document_Library/Press_Releases/2006/July/Statement_from_USTR_Spokesman_Regarding_China_Labor_Petition.html?ht=
48. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of Thea Mei Lee, February 1, 2007.
49. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of Grant Aldonas, February 1, 2007.
50. U.S. House of Representatives, Committee on Ways and Means, Subcommittee on Trade, testimony of Mark Sobel, Deputy Assistant Secretary, U.S. Department of the Treasury, May 9, 2007. The 1988 law is The Omnibus Trade and Competitiveness Act of 1988.
51. Office of the U.S. Trade Representative, *Trade Delivers*, (Washington, DC: April 2007). www.ustr.gov.
52. Senator Carl Levin, D-Mich., speech at Detroit Regional Chamber of Commerce, June 18, 2007; U.S. China Economic and Security Review Commission, *Hearing on Intellectual Property Rights Issues and Counterfeit Goods*, testimony of Senator Orrin G. Hatch, R-Utah, June 8, 2006.
53. Office of the U.S. Trade Representative, *WTO Case Challenging Weaknesses in China's Legal Regime for Protection and Enforcement of Copyrights and Trademarks*, (Washington, DC: April 2007), p. 1.
54. During its June 2006 trip to China, Commissioners heard from American business interests and U.S. Department of State officials about Chinese reluctance to confiscate or destroy machinery used to manufacture counterfeit products.
55. Office of the U.S. Trade Representative Press Release, "United States Requests WTO Panel in Case Challenging Deficiencies in China's Intellectual Property Rights Laws," August 13, 2007.
56. Federal Bureau of Investigation, Los Angeles Division Press Release, July 23, 2007.
57. Office of the U.S. Trade Representative, *Public Hearing before the Trade Policy Staff Committee on China's WTO Compliance*, testimony of Eric Smith, Washington, DC, September 27, 2007.
58. U.S. House of Representatives Committee on Ways and Means, Subcommittee on Trade, testimony of Dan Glickman, Washington DC, February 15, 2007.
59. U.S. House of Representatives Committee on Ways and Means, Subcommittee on Trade, testimony of Dan Glickman, Washington DC, February 15, 2007.
60. For an explanation of this, see U.S. China Economic and Security Review Commission, *Hearing on China's Impact on the U.S. Auto and Auto Parts Industries*, July 17, 2006.
61. Office of the U.S. Trade Representative, *WTO Case Challenging Chinese Subsidies*, (Washington, DC: January 2007). www.ustr.gov.
62. Office of the U.S. Trade Representative, *WTO Case Challenging Chinese Subsidies*, (Washington, DC: January 2007), p. 2.
63. Barry Naughton, *The Chinese Economy, Transitions and Growth* (MIT Press, Cambridge, MA: 2007), p. 297.
64. The World Bank defines the urban poverty line as an income of 1200 renminbi per year and the rural poverty line as an income of 850 renminbi per year. These numbers are generated by collecting and assessing regional data on the cost of food, the average daily caloric intake of local residents, and other local metrics.
65. The World Bank, *China's (Uneven) Progress Against Poverty*, (Washington, DC: September 2004), p. 2.
66. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Daniel Rosen, May 24, 2007.
67. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of George Haley, May 24, 2007.

68. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Clyde Prestowitz, May 24, 2007.
69. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Barry Naughton, May 24, 2007.
70. Wayne M. Morrison, Foreign Affairs, Defense, and Trade Division, Congressional Research Service, telephone interview October 23, 2007.
71. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Thomas Howell, May 24, 2007.
72. Bai Tianliang, "SASAC Official Explains New Guidelines on Further Reductions in SOEs", *Renmin Ribao* (People's Daily), December 19, 2006. www.opensource.gov.
73. James Anderlini, "Beijing to divest half of state firms by 2010," *South China Morning Post*, December 8, 2006. www.opensource.gov.
74. Barry Naughton, *The Chinese Economy, Transitions and Growth* (MIT Press, Cambridge, MA: 2007), p. 303.
75. PRC National Bureau of Statistics, *Statistics Yearbook of China, 2003* (Beijing, China: 2004), pp. 461–463.
76. Barry Naughton, *The Chinese Economy, Transitions and Growth* (MIT Press, Cambridge, MA: 2007), p. 303.
77. Barry Naughton, *The Chinese Economy, Transitions and Growth* (MIT Press, Cambridge, MA: 2007), p. 301.
78. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Barry Naughton, May 24, 2007.
79. Barry Naughton, *The Chinese Economy, Transitions and Growth* (MIT Press, Cambridge, MA: 2007), p. 303.
80. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of George Haley, May 24, 2007.
81. Barry Naughton, *The Chinese Economy, Transitions and Growth* (MIT Press, Cambridge, MA: 2007), p. 318.
82. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Barry Naughton, May 24, 2007.
83. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of George Haley, May 24, 2007.
84. "SASAC: Central SOEs cut to 155" *Xinhua News Agency*, July 21, 2007.
85. "PRC SASAC Official: Restructuring SOEs to Continue," *Xinhua*, December 12, 2006. www.opensource.gov.
86. "Beijing Tightens Grip on Critical Sectors," *Asia Times*, December 20, 2006.
87. "Opinion Urges Speeding Up Reforms of State-Owned Enterprises," *China Daily*, December 20, 2006.
88. See Appendix Appendix VII-C for a complete list of Chinese SOEs controlled by SASAC and a list of those included in the Fortune Global 500.
89. Ren Fang, Cai Min, and Liu Bing, "SASAC Issues Guidelines Identifying Seven Industries for State Economic Control," *Xinhua*, December 18, 2006. www.opensource.gov.
90. Zhi Wang, *The Nature of Chinese Exports of Advanced Technology Products to the U.S.*, online powerpoint presentation, September 26, 2007. www.carnegieendowment.org/files/Zhi_Wang.ppt.
91. Abraham Lustgarten, "China's Stock Boom," *Fortune Magazine*, September 19, 2006.
92. Sourafel Girma, Yudan Gong, and Holger Gong, *Can You Teach Old Dragons New Tricks? FDI and Innovation Activity in Chinese State Owned Enterprises*, (Institute for the Study of Economics, Bonn, Germany: August, 2006).
93. Elaine Wu, "Scrutiny of Mergers as Foreign Cash Flow Shrinks," *South China Morning Post*, June 16, 2006. www.opensource.gov.
94. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of George Haley, May 25, 2007.
95. Commission of the European Communities, *Closer Partners, Growing Responsibilities—A policy paper of EU-China trade and investment: Competition and Partnership*, (Brussels: October, 2006), p. 10.

96. Jan Borgonjon and James A.C. Sinclair, "Signs of More Protectionist Times?," *China Business Review*, November–December 2006.
97. *t/a* is a petrochemical industry term that stands for 'turn around' and refers to the quantity of material that can be fully processed in a given time.
98. PetroChina Fushun Petrochemical Company brochure, 2007.
99. Dan Nystedt, "Analyst: Intel got China fab for a bargain," *IDG News Service*, April 2, 1997.
100. "Regrouping of state-owned companies to speed up," *People's Daily Online*, August 31, 2005. english.peopledaily.com.cn/200508/31/eng20050831_205607.html.
101. "RMRB Says China's State Enterprise Reform on Right Track," *Renmin Ribao* (People's Daily), September 30, 2004. www.opensource.gov.
102. Kwan Chi Hung, *Who Own Chinese State-owned Enterprises—Toward Establishment of Effective Cooperate Governance*, (Research Institute of Economy, Trade and Industry, Tokyo, Japan: July 2006). www.rieti.go.jp/en/china/06072801.html.
103. U.S. House of Representatives Committee on Ways and Means, *Hearing on the Nonmarket Economy Trade Remedy Act of 2007*, testimony of Usha Haley, March 15, 2007.
104. Trevor Hauser and Daniel Rosen, *China Energy: A Guide for the Perplexed*, (Washington, DC: May 2007), p. 14.
105. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Barry Solarz, May 25, 2007.
106. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Barry Solarz, May 25, 2007.
107. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Barry Solarz, May 25, 2007.
108. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Barry Solarz, May 25, 2007.
109. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Clyde Prestowitz, May 24, 2007.
110. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Brad Setser, May 24, 2007.
111. "China's trillion-dollar kitty is ready," *Asia Times*, October 2, 2007. www.atimes.com/atimes/China_Business/IJ02Cb01.html.
112. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Brad Setser, May 24, 2007.
113. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Brad Setser, May 24, 2007.
114. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of David Marchick, May 24, 2007.
115. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Clyde Prestowitz, May 24, 2007.
116. China's government writes its Five Year Plans to set priorities for economic development. The CCP plays a leading role in establishing the economic development strategies and growth targets.
117. A policy bank is state-owned bank that is used to support government policy objectives.
118. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Barry Naughton, May 24, 2007.
119. See Chapter 1, Section 1.
120. Office of the U.S. Trade Representative, "United States Files WTO Case Against China over Prohibited Subsidies," February 2, 2007.
121. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Clyde Prestowitz, May 24, 2007.
122. U.S.-China Economic and Security Review Commission, *Hearing on the Extent of the Government's Control of China's Economy, and the Implications for the United States*, testimony of Thomas Howell, May 24, 2007.

123. ChinaTradeExtra, *Commerce Makes CVD Finding Against China, Duties Range From 10 to 20 Percent*, March 30, 2007.
124. World Trade Organization, *Request for Consultations by China*, September 18, 2007, [www.worldtradelaw.net/cr/ds368-1\(cr\).pdf](http://www.worldtradelaw.net/cr/ds368-1(cr).pdf).
125. "Beijing Tightens Grip on Critical Sectors," *Asia Times*, December 20, 2006.
126. China's trillion-dollar kitty is ready," *Asia Times*, October 2, 2007, www.atimes.com/atimes/China_Business/IJ02Cb01.html.
127. Figures derived from the Stockholm International Peace Research Institute (SIPRI). first.sipri.org/non_first/result_milex.php and www.sipri.org/contents/milap/milex/mex_wnr_table.html.
128. Norman Augustine, "Reshaping an Industry: Lockheed Martin's Survival Story," *Harvard Business Review*, May-June 1997, 83-94; John J. Dowdy, "Winners and Losers in the Arms Industry Downturn," *Foreign Policy*, Vol. 104, 1997, 88-101.
129. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of William Greenwalt, July 13, 2007.
130. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of William Greenwalt, July 13, 2007.
131. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of William Greenwalt, July 13, 2007.
132. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of William Hawkins, July 13, 2007.
133. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of William Greenwalt, July 13, 2007.
134. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of William Hawkins, July 13, 2007.
135. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of William Greenwalt, July 13, 2007.
136. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of William Hawkins, July 13, 2007.
137. *SURGE*, (IAM Journal: Summer 2006), p. 13.
138. *SURGE*, (IAM Journal: Summer 2006), p. 13.
139. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of Owen Herrnstadt, July 13, 2007.
140. Office of Naval Research, *Navy Enlists Microbes to Cut Costs*, ONR Media December 22, 2003. www.onr.navy.mil/media/article.asp?ID=64.
141. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of Tina Ballard, July 13, 2007.
142. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of William Greenwalt, July 13, 2007.
143. Defense News Top 100. www.defensenews.com/index.php?S=06top100. One each of the remaining three top-ten defense firms is located in the United Kingdom, the Netherlands, and France; none of the World's top defense firms is in China—but this may be due partly to Chinese opacity and lack of cooperation with the researchers who compiled the list; Greg Couteau, *Defense News* Copy Chief in an interview with Commission staff, June 25, 2007.
144. Greg Schneider and Renae Merle, "Reagan's Defense Buildup Bridged Military Eras," *Washington Post*, June 9, 2004, E1.
145. Defense News Top 100. www.defensenews.com/index.php?S=06top100.
146. R&D Magazine, *Global R&D Report 2007*, (Northbrook, IL: September 2006), p. G5.
147. R&D Magazine, *Global R&D Report 2007*, (Northbrook, IL: September 2006), p. G5.
148. R&D Magazine, *Global R&D Report 2007*, (Northbrook, IL: September 2006), p. G5.
149. Source: R&D Magazine, *Global R&D Report 2008*, (Northbrook, IL: September 2007), p. G3.

150. China's R&D investment is compared to Japan's with purchasing power parity taken into account; R&D Magazine, *Global R&D Report 2007*, (Northbrook, IL: September 2006), p. G5.
151. R&D Magazine, *Global R&D Report 2007*, (Northbrook, IL: September 2006), p. G5.
152. R&D Magazine, *Global R&D Report 2007*, (Northbrook, IL: September 2006), p. G5.
153. R&D Magazine, *Global R&D Report 2007*, (Northbrook, IL: September 2006), p. G5.
154. R&D Magazine, *Global R&D Report 2008*, (Northbrook, IL: September 2007), p. G3.
155. R&D Magazine, *Global R&D Report 2008*, (Northbrook, IL: September 2007), pp. G3, G4.
156. R&D Magazine, *Global R&D Report 2008*, (Northbrook, IL: September 2007), p. G4.
157. R&D Magazine, *Global R&D Report 2008*, (Northbrook, IL: September 2007), p. G3.
158. Purchasing Power Parity.
159. R&D Magazine, *Global R&D Report 2008*, (Northbrook, IL: September 2007), p. G3.
160. John Parmentola, *Army Science and Technology Investment Priorities*, Department of the Army briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 16.
161. John Parmentola, *Army Science and Technology Investment Priorities*, Department of the Army briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 3.
162. John Parmentola, *Army Science and Technology Investment Priorities*, Department of the Army briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, pp. 12–16.
163. Patricia L. Gruber, *Department of the Navy Science and Technology Program*, Department of the Navy briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 7.
164. Patricia L. Gruber, *Department of the Navy Science and Technology Program*, Department of the Navy briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 7.
165. Patricia L. Gruber, *Department of the Navy Science and Technology Program*, Department of the Navy briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 28.
166. Christine M. Anderson, *Strategy and Investments*, Department of the Air Force briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 4.
167. Brendan B. Godfrey, *Strategy and Investments*, Department of the Air Force briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 7.
168. Brendan B. Godfrey, *Strategy and Investments*, Department of the Air Force briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 15.
169. Brendan Godfrey, *Air Force Basic Research Overview*, Department of the Air Force briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 29.
170. Brendan Godfrey, *Air Force Basic Research Overview*, Department of the Air Force briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, pp. 33–35.
171. Robert F. Leheny, *Brief to U.S.-China Economic & Security Review Commission*, Defense Advanced Research Projects Agency briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 2.
172. Robert F. Leheny, *Brief to U.S.-China Economic & Security Review Commission*, Defense Advanced Research Projects Agency briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 2.
173. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Rick Weddle, September 6, 2007.
174. U.S. Department of Labor, Bureau of Labor Statistics, www.bls.gov. North Carolina's seasonally adjusted rate was 5.0 percent in July while that of the nation was 4.6 percent. Michigan's was the highest at 7.2 percent. Idaho was lowest at 2.3 percent. North Carolina was 36th highest of 50 states.

175. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Gary Gereffi, September 6, 2007.

176. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Betty McGrath, September 6, 2007.

177. Eric O'N Fisher and Peter C. Rupert, *The Decline of Manufacturing Employment in the United States*, (Federal Reserve Bank of Cleveland, Cleveland, OH: December 2005).

178. The effect of capital investment on jobs is a matter of controversy. Companies that invest in labor-saving production enhancements can and do argue they are saving jobs by staying in business, even as they furlough workers.

179. U.S. Department of Commerce, U.S. Bureau of Economic Analysis, www.bea.gov; Federal Reserve Board of Governors. www.federalreserve.gov.

180. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Patrick Conway, September 6, 2007.

181. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Betty McGrath, September 6, 2007.

182. Charles W. McMillion, *Briefing Paper for the U.S.-China Economic and Security Review Commission*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, August, 2007, p. 32.

183. Charles W. McMillion, *Briefing Paper for the U.S.-China Economic and Security Review Commission*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, August, 2007, p. i; U.S. Department of Commerce, Bureau of Economic Analysis, "News Release: State Personal Income 2006," March 27, 2007. www.bea.gov/newsreleases/regional/spi/2007/spi0307.htm.

184. In comparison, in 2002, China's per capita income was \$1,100 and it doubled to \$2,010 in 2006, placing it 129th in the world, according to *China Daily*, September 20, quoting the China National Statistics Bureau.

185. The North Carolina Rural Economic Development Center, *Gaining a Foot-hold*, (Raleigh, NC: April 2005), p. 9.

186. The North Carolina Rural Economic Development Center, *Gaining a Foot-hold*, (Raleigh, NC: April 2005), p. 10.

187. Dr. Betty McGrath, telephone interview with Commission staff, October 2007.

188. The North Carolina Rural Economic Development Center, *Gaining a Foot-hold*, (Raleigh, NC: April 2005).

189. North Carolina Employment Security Commission, *Pillowtex Worker Update*, (Raleigh, NC: July 2007) p. 3.

190. The North Carolina Rural Economic Development Center, *Gaining a Foot-hold*, (Raleigh, NC: April 2005).

191. U.S. Census Bureau, *Statistical Abstract of the United States: 2004-2005*, (Washington, DC: October 2004); North Carolina Employment Security Commission, "Civilian Labor Force Estimate for NC Counties for 2006." eslmi40.esc.state.nc.us/ThematicLAUS/clfasp/CLFAASY.asp.

192. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Betty McGrath, September 6, 2007. Figures are from the U.S. Department of Labor, Employment and Training Administration.

193. Manufacturing workers who lose their jobs due to international trade become eligible for special benefits under the Trade Adjustment Assistance Act after application is made and approved on their behalf. The application can be initiated by the dislocated worker, the employer, a union, or a government agency.

194. Charles W. McMillion, *Briefing Paper for the U.S.-China Economic and Security Review Commission*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, August, 2007.

195. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Dr. Patrick Conway, September 6, 2007.

196. Other major apparel exporting countries with membership in the WTO also enjoyed the phase-out of the quotas. But such major exporters as India, Pakistan, Bangladesh, Turkey, and The Philippines do not have China's myriad competitive advantages.

197. Paul Magnusson, "There's No Holding Back China's Textile Tide," *BusinessWeek Magazine*, May 9, 2005, 59.

198. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Jim Chesnutt, September 6, 2007. Mr. Chesnutt is the President and CEO of National Spinning Company of Washington, North Carolina, and is a director of the National Council of Textile Organizations.

199. Charles W. McMillion, *Briefing Paper for the U.S.-China Economic and Security Review Commission*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, August, 2007.

200. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Jim Chesnutt, September 6, 2007.

201. National Council of Textile Organizations, *Government of China Industry Subsidies (Applicable to Textile Industry)*, 2007.

202. In January 2005, the U.S. Department of Commerce imposed antidumping penalties against Chinese wooden furniture manufacturers after finding that Chinese furniture was being sold at below the cost of production.

203. Stephen Cooney, *U.S. Furniture Manufacturing: Overview and Prospects*, (Congressional Research Service, Washington, DC: May 2007), p. 7.

204. Stephen Cooney, *U.S. Furniture Manufacturing: Overview and Prospects*, (Congressional Research Service, Washington, DC: May 2007), p. 8.

205. Robert L. Lacy, Federal Reserve Bank of Richmond, *Whither North Carolina Furniture Manufacturing?* (Federal Reserve Bank of Richmond, Richmond, VA: September 2004), p. 2.

206. Robert L. Lacy, Federal Reserve Bank of Richmond, *Whither North Carolina Furniture Manufacturing?* (Federal Reserve Bank of Richmond, Richmond, VA: September 2004), p. 15.

207. The sales of Chinese wooden furniture at prices below the cost of production is what led the U.S. Department of Commerce and the U.S. International Trade Commission to recommend dumping penalties against the Chinese imports.

208. U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Wyatt Bassett, September 6, 2007.

209. An antidumping complaint to the U.S. Commerce Department would require the support of a minimum of 25 percent of the industry's firms.

210. Wyatt Bassett, telephone interview with Commission staff, August, 2007.

211. Charles W. McMillion, *Briefing Paper for the U.S.-China Economic and Security Review Commission*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, August, 2007.

212. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Patrick Conway, September 6, 2007.

213. Duke University, the University of North Carolina at Chapel Hill, and North Carolina State University.

214. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Rick Weddle, September 6, 2007.

215. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Rick Weddle, September 6, 2007.

216. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Rick Weddle, September 6, 2007.

217. According to RTP figures, the park is 14 times larger in land area than the average of 505 acres and has 18 times the capital investment than the average research park at \$158 million.

218. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Michael Chen, September 6, 2007.

219. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Betty McGrath, September 6, 2007.

220. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Harris L. Raynor, September 6, 2007.

221. The U.S.-China Economic and Security Review Commission, *Hearing on China's Impact on the North Carolina Economy: Winners and Losers*, testimony of Thomas J. White, September 6, 2007.

222. The provision was renamed Permanent Normal Trade Relations in legislation granting new trade privileges to China. The legislation lowered tariffs on China's imports to the lowest levels levied on imports from all other WTO members.

CHAPTER 2
CHINA'S SECURITY-RELATED
ACTIVITIES
SECTION 1: CHINA'S MILITARY
MODERNIZATION

“The Commission shall investigate and report on—
“REGIONAL ECONOMIC AND SECURITY IMPACTS—The tri-
angular economic and security relationship among the United
States, [Taiwan], and the People’s Republic of China (including
the military modernization and force deployments of the Peo-
ple’s Republic of China aimed at [Taiwan]), the national budg-
et of the People’s Republic of China, and the fiscal strength of
the People’s Republic of China in relation to internal insta-
bility in the People’s Republic of China and the likelihood of
the externalization of problems arising from such internal in-
stability.”

U.S. Perspectives on China’s Military Modernization

Beijing’s most recent defense White Paper, *China’s National Defense in 2006*, outlines the objectives of China’s national defense policy and the course of its military modernization. Mr. Cortez Cooper, Director of East Asian Studies at Hicks and Associates, Incorporated, summarized these objectives in his testimony before the Commission:

1. *Uphold national security and unity, and ensure the interests of national development.*
2. *Provide the source of strength for consolidating the rule of the Communist Party ... and a solid security guarantee for sustaining this period of strategic opportunity for national development.*
3. *Guard against and resist aggression ... defend against violation of China’s territorial sea and air space, and borders.*
4. *Oppose and contain the separatist forces for Taiwan independence and their activities.*
5. *Take precautions against and crack down on terrorism, separatism, and extremism in all forms.¹*

Although official Chinese statements and White Papers maintain that China’s security policy is purely defensive in nature, Mr. Cooper contends that the People’s Liberation Army (PLA) derives offensive missions from these objectives. Mr. Cooper further argues

that the requirement to deter Taiwan from pursuing independence is the core driver for the PLA's development of offensive missions.² The importance to China of this objective requires the PLA to possess the ability to launch offensive operations against Taiwan should it decide to do so, and to deter and delay the United States or other countries from assisting in Taiwan's defense.³

Contingencies involving Taiwan will remain the central focus of Chinese planning and force acquisition for the near term, and according to Dr. Bernard Cole, Professor at the National War College, the ability of Taiwan's defense forces to defend the island in the event of a Chinese attack is diminishing. In his testimony, he noted that while Taiwan's armed forces are arguably better trained than their PRC counterparts, they also are relatively under-armed in every service.⁴ Dr. Cole emphasized the importance of this by noting that if armed conflict were to break out between the two, it is unlikely that Taiwan could withstand the pressure from the PRC for more than a few weeks. He also remarked that, even with the addition of the defense systems funded by the Special Budget that was stalled in the Legislative Yuan for more than five years, Taiwan's armed forces still would face a significant challenge to defending the island.⁵ It is doubtful that the small portion of defense items finally approved by the Legislative Yuan in June 2007 will do much to decrease the strategic challenges faced by Taiwan.⁶ Indeed, it has become the consistent criticism of the United States government over the past decade that Taiwan is not preparing sufficiently for its own defense and is too reliant on the potential intervention of U.S. forces. Notably, China is preparing for this potential intervention as it seeks to develop forces that can deter or effectively counter U.S. operations in and around Taiwan.

The U.S. Department of Defense's 2007 *Annual Report to Congress on the Military Power of the People's Republic of China* points out that China's first objective in order to prevent Taiwan's independence is to prepare its military to be able to pursue broader regional and global objectives.⁷ Dr. James Holmes, Associate Professor at the Naval War College, testified that once China "secures the East, Yellow, and South China Seas to its satisfaction, Beijing will vector its nautical energies not eastward but toward the south and southwest, where its interests in energy security and economic development lie."⁸ This mission includes protecting sea lanes that support the transport of resources vital to China's economic growth and securing China's territorial claims, as well as confronting regional threats of terrorism.

Components of Chinese Military Modernization

Expenditures versus Capabilities

Western literature on Chinese military modernization, as well as Chinese National Defense White Papers, acknowledge that China presently is in the midst of a lengthy round of extensive military modernization with the aim of creating a professional, high-technology fighting force equal to those of the world's best militaries.⁹ To this end, according to International Monetary Fund data, China raised its defense budget at an annual average rate of 11.8 percent (inflation adjusted) per year from 1996 to 2006.¹⁰ When that rate

is compared to a GDP growth of 9.6 percent (inflation adjusted) per year during that some period, it is clear that military development is a high priority for Beijing.¹¹ In March 2007, the Chinese government news agency announced that China's defense budget would increase by 17.8 percent this year to a total of \$44.94 billion.¹² The Pentagon believes this figure is significantly understated and that China's actual defense budget is closer to two or three times this amount, or \$85–\$125 billion.¹³ Because of the opacity of Beijing's expenditures, particularly those that are military-related, it is difficult for analysts to agree on precise figures.

In his testimony before the Commission, Defense Science Board Chairman William Schneider argued that looking at capabilities (outputs) rather than budgets (inputs) in these assessments "may in some ways be more informative than trying to calculate how the inputs are measured."¹⁴ The increasingly sophisticated capabilities purchased with such expenditures are readily demonstrated and serve as a good measure by which to judge the success of China's military modernization endeavor. While larger defense budgets do not necessarily reflect an increase in capabilities, in the case of Beijing's funding of the PLA's modernization, the Commission believes there is a strong correlation. Analysts and policymakers on numerous occasions have been surprised at the pace of China's achievements. Testifying before the Commission, Congressman J. Randy Forbes (4th District of Virginia) expressed his experience in witnessing China's military developments:

The only thing . . . that continues to surprise me, is that our government continues to be surprised over and over again by what we find and what we see in the development of China.¹⁵

In its 2006 Quadrennial Defense Review Report (QDR), the Department of Defense categorized the military threats facing the United States in four groups: (1) traditional warfare; (2) disruptive warfare, which relies upon asymmetric capabilities that exploit an opponent's weaknesses; (3) catastrophic warfare through the use of weapons of mass destruction (WMD); and (4) irregular warfare in which combat operations are carried out by dispersed, non-state actors such as terrorists.¹⁶ The Commission used this framework to organize its March 2007 hearing on the progress China is making in modernizing its military. The analysis in this section focuses on the impact of newly acquired capabilities within these groupings, rather than on Chinese military expenditures. Because there is no evidence of which the Commission is aware that China is engaged in sponsoring or supporting irregular warfare, this analysis will address only the other three categories.

China's Traditional Warfare Capabilities

The PLA is improving its traditional warfare capabilities by purchasing new advanced systems and by increasing the capabilities of its indigenously produced systems. As China surveys scenarios of potential future conflict, one of the most likely is a conflict over Taiwan in which the United States and/or Japan may intervene. This understanding has guided China's investment in its conven-

tional military forces over the last 15 years, during which the majority of the resources for weapons acquisition has gone to the Navy and Air Force rather than to the Army. Nonetheless, the current pattern of military acquisition also suggests that China is preparing consciously for other types of and locations for armed conflict (or efforts to deter conflict with shows of force).

Testifying before the Armed Services Committee of the U.S. House of Representatives in June 2007, then-Deputy Under Secretary of Defense for Asian and Pacific Security Affairs Richard P. Lawless noted improvements China has made in its conventional weapons, including the production of second generation nuclear powered submarines, fielding of air and amphibious lift capabilities, and introduction of new amphibious armored vehicles in ground forces based opposite Taiwan.¹⁷

Navy

The PLA continues to modernize its Navy with an emphasis on those platforms that are best suited for littoral or “green water” operations. Chinese strategists are well aware of U.S. military assistance to Taiwan and are developing strategies and capabilities to deter or delay the arrival of U.S. forces in the theater. Chinese doctrine in this area stresses the use of pre-emptive, decisive strikes on forward bases and staging areas such as Guam and Okinawa, and employment of a variety of platforms to deny the operational use of the waters in the Chinese littoral.¹⁸ Presently, the PLA Navy possesses the capabilities to maintain sea denial operations out to 400 miles from China’s coastline for a period of days.¹⁹ By 2010 China is expected to be able to sustain such operations for a period of weeks.²⁰

China has completed the acquisition of a fleet of a dozen Kilo-class submarines from Russia. It also obtained from Russia a complement of advanced SS-N-22 Sunburn and SS-N-27 Sizzler supersonic anti-ship cruise missiles,²¹ the former to give its Sovremenny-class destroyers supersonic anti-ship missile capability and the latter to give its Kilo-class submarines and possibly also its Yuan-class submarines comparable anti-ship capability.²² These low altitude, sea-skimming missiles were specifically designed for attacking U.S. aircraft carrier strike groups and to defeat the Aegis anti-missile system by employing a low cruising altitude and supersonic speed.²³ Simultaneously, the PLA Navy is launching ever-larger numbers of indigenously developed Song- and Yuan-class submarines, the latter of which may be equipped with an air-independent propulsion system for improved endurance.²⁴

China’s Navy may not yet have a consistently reliable means to detect and target oncoming U.S. vessels, although it has a variety of means of acquiring limited targeting information.²⁵ Since 1996, PLA Navy officers have been seeking to develop the capability to attack a deployed aircraft carrier battle group with ballistic missiles. Recent Chinese military publications indicate that officers believe China is now able to achieve this military objective.²⁶ Additionally, China may be in the process of developing anti-ship homing warheads, which would make defending against oncoming anti-ship cruise missiles very difficult.²⁷

The PLA Navy surface fleet also has made substantial progress in raising its air defense and surface warfare capabilities. Its three newest classes of surface combatants, the Luyang II and Luzhou-class destroyers and Jiangkai II-class frigate, are equipped with sophisticated air-search and missile guidance radars and long-range, vertical launch, surface-to-air missiles.²⁸ However, the anti-submarine warfare capabilities of these vessels are weak—as was the case with their predecessors.²⁹

In his testimony, Dr. Andrew Erickson, Professor at the U.S. Naval War College, predicted that in the near term, naval power projection will remain lower on the PLA Navy's list of priorities than littoral operations.³⁰ Despite its shipyards' latent production capacity, China has not engaged in the serial production of replenishment-at-sea ships, considered essential for the re-supply of surface action groups engaged in blue water operations. Even though its shipyards are fully capable of building replenishment vessels, they are not being built, which suggests that the PLA Navy is limiting its short-term focus to scenarios closer to the mainland.³¹

Similarly, even though China has benefited from close to two decades of aircraft carrier design study, it still has not produced a single operational carrier platform. There are indications that the PLA Navy soon may refurbish the Russian carrier Varyag that it acquired from Ukraine and place it in an operational state.³² Development of an aircraft carrier or a replenishment fleet would indicate a significant shift in China's naval objectives, namely the movement toward a more outward-looking force posture that would have the ability to conduct long-range missions for an extended period of time. If, as Mr. Cooper posits, China launches ten of its new nuclear-powered Shang-class submarines by the end of 2008, this development would suggest a new emphasis on blue water naval capabilities on the part of Chinese strategists.³³

During its fact-finding trip to China in April 2007, the Commission visited the PLA Academy of Military Sciences. The officers at the Academy noted that they consider it their responsibility to defend Chinese interests in the region and around the world, and that this includes, especially, China's sources of energy. They believe this requires a force projection capacity that, in turn, necessitates development of a blue water navy. (See Chapter 3, Section 3 for further discussion of the role of energy security in China's determination to develop blue water naval capabilities.)

Chinese advancements in naval modernization have been so substantial that they are leading some experts to consider the possibility of China partnering with the U.S. Navy in protecting freedom of navigation and maritime security on the high seas, through participation in the "Thousand-Ship Navy" concept recently proposed by then-Chief of Naval Operations and current Chairman of the Joint Chiefs of Staff Admiral Michael Mullen.³⁴ French newswire *Agence France-Presse* reported that Admiral Mullen asked Chinese Navy leaders to consider participation in the initiative.³⁵ Rear Admiral (Retired) Eric McVadon, former U.S. Defense Attaché in Beijing, has confirmed that Admiral Mullen made the suggestion to PLA Navy leaders.³⁶ Testifying before the Commission, RADM McVadon said he also favors the idea.³⁷

However, there are impediments to success in building such a partnership with China. According to section 1203 of the National Defense Authorization Act for Fiscal Year 2000, U.S. armed forces are restricted from engaging in certain cooperative activities with the PLA that would provide inappropriate access to advanced American technologies and capabilities.³⁸ This provision likely would not permit the U.S. Navy to engage in the forms of operational information sharing and strategic planning with the PLA Navy that would be required for such military-to-military collaboration.

Air Force

China has always considered air superiority over the Taiwan Strait as a precondition for successful invasion of Taiwan. With the objective of achieving this superiority, it has heavily funded the PLA Air Force over the last 15 years. In the early 1990s, China abandoned its hope of building an advanced fleet of fighter aircraft through only indigenous means and instituted a two-track system of acquiring advanced fighters from abroad while continuing to pursue domestic programs. Today, the PLA Air Force possesses close to 300 of the Russian Sukhoi family of aircraft, including fourth generation, imported Su-27s and Su-30s, and licensed, co-produced Su-27s, designated the "J-11." It also is manufacturing in increasing numbers its first indigenous, light-weight, fourth-generation fighter, the J-10.³⁹

China continues to rely primarily on foreign purchases to fulfill its requirements for strategic-lift and aerial-refueling aircraft, the former necessary for an invasion of Taiwan, and both necessary for effective power projection beyond China's borders. The IL-78 still serves as the mainstay for PLA Air Force aerial refueling, though it has been supplemented by H-6 bombers reconfigured for this purpose. According to Mr. Cooper, China recently agreed to a deal to purchase additional IL-76 transport aircraft from Russia that would increase its lift capacity for airborne forces by as much as 150 percent.⁴⁰

As evidenced by its modernization trends, the PLA Air Force understands the importance of developing a fleet with information systems that can be integrated in a theater-wide command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) system. This type of integration is needed to conduct multidimensional combat operations, and, to that end, the PLA Air Force has sought to install data links in all its advanced fighter aircraft and to build or acquire airborne early warning aircraft. China's handful of Y-8 and KJ-2000 aircraft fulfills this latter requirement to a limited degree. Development of the KJ-2000 is China's answer to the United States blocking China's \$1 billion deal to purchase Israel's "Phalcon" early warning system in 2000. The KJ-2000 system provides a similar capability; it is based on the Russian A-50 airframe and uses indigenous phased array radar.⁴¹

Army

Despite the fact that China's defense budget has favored the PLA Navy and Air Force over the last decade and a half, the modernization of China's ground forces constitutes an important component of the overall development of China's armed forces. The Army continues to train in combined arms warfare and to focus on improving the quality of its infantry, armor, and artillery operations. However, unlike the Air Force and Navy, the Army has developed no new major weapon systems indigenously. Most of the modernization of the Army is done by adapting new technologies to old platforms. This includes integrating better C4ISR hardware, which allows the Army to participate in joint operations with the Navy and Air Force, and to train in the types of air mobile and amphibious assault operations that it would be called upon to undertake in a potential conflict over Taiwan. According to Mr. Cooper, about a quarter of the PLA's maneuver divisions and brigades focus on training for amphibious operations at four or more major amphibious training bases.⁴²

The Army also is modernizing its doctrine and training programs. Even though training across the Army continues to lag behind that of the PLA Navy and Air Force, in recent years the U.S. Department of Defense has witnessed significant efforts dedicated to improving the professionalism and effectiveness of all PLA services. These efforts include developing a professional non-commissioned officer corps, improving the professional military education programs for officers, reforming and improving the quality of training, raising the pay of enlisted personnel, and emphasizing integration of information technology in daily operations.

Second Artillery

China's ballistic missile force, consisting of medium- and short-range ballistic missiles, constitutes a crucial component of the force arrayed against Taiwan and is expected to fulfill an important theater-level precision strike role for China if armed conflict should arise. Presently, the Second Artillery's arsenal of 900 short-range ballistic missiles is being augmented at a rate of roughly 100 missiles per year.⁴³ Additionally, the lethality of these missiles has increased through the development of more sophisticated warheads.⁴⁴ Chinese ballistic missiles can hit U.S. bases in the Western Pacific where a large number of U.S. forces are based. Some longer range missiles such as the CSS-3 and CSS-2 are capable of targeting locations not only in Taiwan but also in Okinawa, Japan, and Guam.⁴⁵ (See the map on page 13.)

One final development in China's conventional missile force opposite Taiwan is noteworthy. The Second Artillery is designing a variant of the DF-21 intermediate-range ballistic missile with a maneuverable reentry vehicle (MaRV).⁴⁶ This weapon could be very difficult for U.S. carrier groups to defend against due to its maneuverability and its extremely high terminal speed. In addition, according to RADM (Ret) McVadon, it appears that these missiles may incorporate advanced penetration aids. However, because the DF-21's guidance system does not allow much flexibility in the missile's flight trajectory, it could have difficulty striking a U.S.

vessel if the vessel is moving at full navigation speed. The Aegis system used by U.S. carrier groups gives American ships enough advanced warning of incoming missiles that evasive action can be taken. Yet, even if a successful strike on a U.S. carrier cannot be achieved, the prospect of such a strike could accomplish “coercive isolation” of American vessels—causing U.S. carrier groups responding to a Taiwan crisis to operate further out from the Taiwan Strait combat theater,⁴⁷ thus making air operations in the Strait vicinity more difficult.⁴⁸

Integrated Operations

The PLA’s understanding of joint operations (*lianhe zuozhan*) is similar to that of the United States. These operations involve the coordinated use of all the military services (Army, Navy, and Air Force) and their integrated arms and branches.⁴⁹ Recently, the PLA has expanded its military doctrine to include the concept of integrated operations (*yiti zuozhan*). Integrated operations are joint, and are conducted across and throughout all of what the PLA defines as the domains of war: land, maritime, air, space, cyber-space, and the electromagnetic spectrum.⁵⁰ Integrated joint operations require central command and control that direct and coordinate the missions of the full spectrum of force components. This level of integration across the service branches requires information networks to transmit battle space awareness data and joint strike commands. The infusing of information-network hardware and technology necessary for such integrated command and control into military systems and doctrine is what PLA writings refer to as informatization.⁵¹ Dr. James Mulvenon, Director of the Center for Intelligence Research and Analysis at Defense Group, Incorporated describes the concept in the following terms:

*The integration of advanced [information technology] into the PLA’s hybrid inventory of near-state-of-the-art and older systems is the heart of what the PLA calls “informatization,” which is a primary dynamic driving the central warfighting scenario of “local, high-tech wars under informatized conditions.”*⁵²

According to Mr. Cooper’s testimony, China’s weapons acquisitions and training are guided by this desire to win “informatized wars,” or wars that are heavily reliant on computers and information systems.⁵³ Beijing’s strategists believe that future conflicts involving China will be limited in geographical scope, duration, and political objectives, and will be highly dependent on command, control, communications, and computer (C4) systems.⁵⁴ Thus, the ability of China’s military forces to integrate their operations, increase their awareness of the battlefield, and coordinate the execution of commands influences the direction of China’s military acquisitions and personnel training.

A more integrated architecture achieved through the use of more advanced C4ISR systems would enable the PLA to conduct joint operations and to fuse data from intelligence, surveillance, and reconnaissance (ISR) assets into a near real-time sensor-to-shooter network. Such advances have the potential to give the PLA over-the-

horizon strike capabilities; non-kinetic, counter-C4ISR capabilities; and ability to perform air superiority, airborne, and air-mobile operations.⁵⁵ These new capabilities not only make the PLA a more formidable opponent on the battlefield, but also will require any U.S. carrier battle group intervening in the defense of Taiwan to operate at a much greater distance from China's coast.

China's Disruptive Warfare Capabilities

Disruptive warfare is a form of non-traditional, asymmetric warfare that aims to undermine an opponent's strengths by exploiting weaknesses.⁵⁶ DoD believes that China's logical strategy is to favor asymmetric capabilities that target and exploit the weaknesses of China's militarily superior opponents, especially the United States, increasing the potential that China can defeat them.⁵⁷

According to Dr. Ehsan Ahrari, professor at the Asia-Pacific Center for Security Studies, China seems to have found its niche in fielding various weapon systems such as cyber weapons and anti-satellite weapons that are specifically designed to wage this type of warfare.⁵⁸ The trend in China's military modernization toward fielding disruptive capabilities is so unmistakable that the 2006 QDR stated:

Of the major and emerging powers, China has the greatest potential to compete militarily with the United States and field disruptive military technologies that could over time offset traditional U.S. military advantages absent U.S. counter strategies.⁵⁹

Mr. James Lewis, Director of the Technology and Public Policy Program at the Center for Strategic and International Studies, explains why the development of disruptive capabilities is particularly appealing to China:

China's military is not a peer to the U.S., but it is a challenger. The challenge comes from a combination of increased conventional capabilities and from the pursuit of asymmetric advantage—using new weapons and tactics to attack an opponent in areas where it is weak or vulnerable. Seeking asymmetric advantage is not new, nor is China the only country to seek it. What is new is the means that U.S. opponents like China and others plan to use to gain asymmetric advantage. One part of the modernization effort looks for ways to counter U.S. force projection capabilities. Other modernization efforts look for ways to erode the U.S. military advantage by attacking information and communications assets, including satellites and networks.⁶⁰

This approach to warfare offers China a possible solution to the disparity between the capabilities of the PLA and U.S. forces, while not requiring China to build a military fully equal to that of the United States.⁶¹

Among the disruptive capabilities China is fielding is the ability to conduct cyber attacks. General James Cartwright, then Commander of the U.S. Strategic Command (USSTRATCOM) and currently Vice Chairman of the Joint Chiefs of Staff, testified before

the Commission that China is actively engaging in cyber reconnaissance by probing the computer networks of U.S. government agencies as well as private companies.⁶² The data collected from these computer reconnaissance campaigns can be used for myriad purposes, including identifying weak points in the networks; understanding how leaders in the United States think; discovering the communication patterns of American government agencies and private companies; and obtaining valuable information stored throughout the networks. General Cartwright testified that this information is akin to that which in times past had to be gathered by human intelligence over a much longer period of time. He went on to say that in today's information environment, the intelligence exfiltration that once took years can be accomplished in a matter of minutes in a single download session.⁶³

General Cartwright also addressed another type of cyber attack that disables computer systems or networks by overloading them with commands. This form of attack, known as denial of service, has the potential to cause cataclysmic harm if conducted against the United States on a large scale.⁶⁴ China currently is thought by many analysts to have the world's largest denial-of-service capability.⁶⁵ General Cartwright presented his view of the seriousness of a large scale denial-of-service attack:

The [Chinese] capabilities that are most intriguing are their dedication to, one, bringing [cyber warfare] into their military structure; two, building schools all the way through doctrine, et cetera, and [establishing] plans to be able to use this type of capability in a military context . . . I don't think the [United States] has gotten its head around the issue yet, but I think that we should start to consider that regret factors⁶⁶ associated with a cyber attack could, in fact, be in the magnitude of a weapon of mass destruction.⁶⁷

A delegation of Commissioners met with officers from the PLA's Academy of Military Sciences while in China in April 2007. When questioned about cyber attacks, officers noted that scholars hold differing opinions about whether a computer network attack may constitute an act of war. Some argued it meets that definition, but others argued that a network attack alone without corresponding conventional attacks does not constitute an act of war. However, the PLA officers acknowledged that if a cyber attack targets military capabilities of another country and does significant damage, conventional counterattacks are warranted. They also noted the frequent difficulty in accurately identifying the source of cyber attacks and argued that the source must be clearly identified before a counterattack could be responsibly launched.

In addition to cyber attacks, Chinese leaders are interested in developing disruptive capabilities for anti-satellite missions as well. China's free-electron and chemical oxygen-iodine high energy lasers could be used to permanently or temporarily blind satellites, as was demonstrated when China temporarily blinded a U.S. satellite in late 2006.⁶⁸ Chinese researchers also have begun testing high power microwave weapons that could be used to jam satellite communications.⁶⁹ The successful anti-satellite test conducted by the

PLA in January 2007 demonstrated the PLA's ability to destroy satellites through the use of kinetic weapons as well. The kill vehicle was placed atop a DF-21 medium-range ballistic missile (MRBM) that reportedly was launched from a land-based mobile system.⁷⁰ The road-mobile launch capability provides built-in survivability, because such mobile systems are difficult to target, and thus make retaliatory or preemptive counterstrikes problematic. Deputy Under Secretary Lawless explained to the Commission why the Chinese leadership most likely was aware of the test:

The suggestion that the Chinese leadership ... may not have known about the test I find rather farfetched. Hu Jintao is the Chairman of the Central Military Commission. This engagement that we have with them, albeit at an embryonic stage, is in a critically important area and the leadership of China understands the importance we assign to the weaponization of space and space activities. So it is hard to imagine that this was a surprise to the leadership of China. If it was a surprise, then we have a different problem, but I don't believe it was.⁷¹

During the Commission's April 2007 visit in China, Mr. Xie Feng, Ministry of Foreign Affairs Director General for North American Affairs, told Commissioners that President Hu was aware of the test beforehand.⁷²

An Assessment of China's Anti-Satellite and Space Warfare Programs, Policies, and Doctrines

The Commission received information through its public hearings and classified defense and intelligence briefings during 2006 concerning China's anti-satellite and space warfare programs, policies, and doctrines, and concluded that it needed more information about China's activities and intentions in these areas. In October 2006, the Commission commissioned research to examine Chinese military literature in the public domain for any such information.

The research, drawing from nearly 100 Chinese sources, identified 30 proposals and recommendations by Chinese military leaders to the Chinese political leadership regarding the development of space and counter-space weapons and programs. Among these proposals and recommendations are:

- ensuring that development and construction of Chinese space and counter-space weapons are conducted covertly so China can maintain a positive international image
- supporting the development of civilian technologies that also can be applied to military space programs
- acquiring the ability to destroy or temporarily incapacitate every enemy space vehicle when it is located above China
- acquiring the ability to attack the American global positioning system (GPS) through various means including anti-satellite weapons, high energy weapons, high energy weather monitoring rockets, and ground attacks on earth-based stations

An Assessment of China’s Anti-Satellite and Space Warfare Programs, Policies, and Doctrines—Continued

- developing Chinese stealth satellites
- developing a Chinese space program to provide key support for Chinese combat forces

Some of these proposals appear to have been implemented already, as evidenced by January’s kinetic anti-satellite test and earlier laser incidents involving American satellites.

China’s Catastrophic Warfare Capabilities

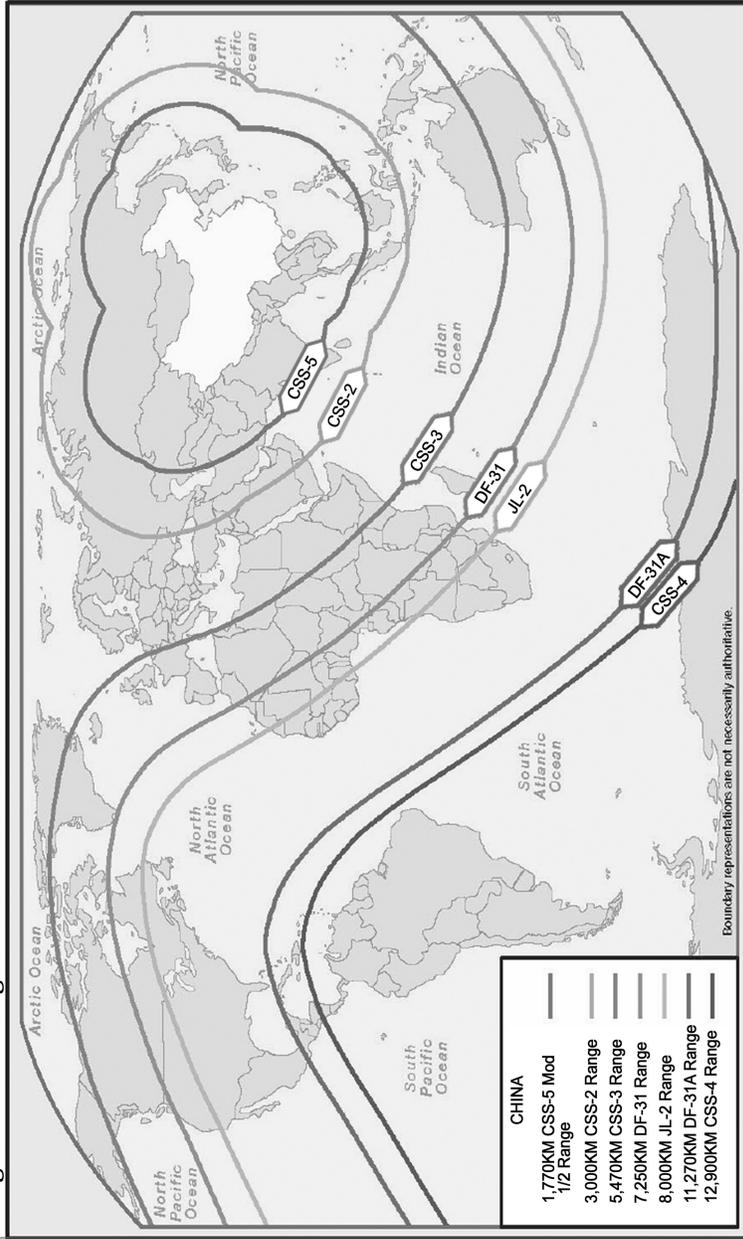
Catastrophic forms of warfare include the use of nuclear missiles and other WMD against an opponent. The PLA’s capacity to wage catastrophic warfare is improving, as development continues on both the nuclear and conventional components of China’s strategic missile forces under the control of the Second Artillery.

Although China officially maintains a “no first use” policy with respect to its nuclear weapons, it is engaged in the modernization of its nuclear arsenal to improve both the survivability and the range of its strategic nuclear missile forces.⁷³

Presently, China has two different systems of land-based ballistic missiles capable of targeting substantial portions of the United States. Its land-based, solid-fuel, road-mobile DF-31A intercontinental ballistic missile constitutes its strongest means of nuclear deterrence. With an 8,000 mile range, it is capable of rapid deployment against targets throughout Asia, Europe, Africa, and North America; it is at low risk from retaliatory or preemptive strikes because of its mobility, and the rapid launch capability offered by solid fuel technology.⁷⁴ The older CSS-5 road-mobile, solid-fuel MRBM has similar characteristics, but its much shorter range limits it to regional missions.⁷⁵ The Chinese nuclear arsenal also presently includes nearly 60 nuclear-armed missiles of various ranges that rely on older liquid fuel technology—significantly increasing launch preparation time. Included in this group of missiles are approximately 20 silo-based CSS-4 ICBMs capable of reaching any target in the United States, approximately 20 CSS-3 ICBMs capable of targeting most of Asia and Europe and parts of Alaska, and between 14 and 18 CSS-2 intermediate-range ballistic missiles (IRBMs) with a much shorter range, capable of targeting only locations within Asia.⁷⁶

With the introduction of the DF-31’s sea-launched naval counterpart, the JL-2, on the Jin-class submarine, China will possess an even more survivable nuclear deterrent that could target most locations in the United States from protected underwater locations off China’s coast.⁷⁷ The older version, the JL-1, launched from Xia-class submarines, is capable of only regional deterrence missions much like its land-based counterpart, the CSS-5.⁷⁸

Figure 2.1 Ranges of China's Ballistic Missiles



Source: U.S. Department of Defense, Annual Report to Congress on the Military Power of the People's Republic of China. (Washington, DC: July 2007), p. 19. Range ring labels added by U.S.-China Economic and Security Review Commission for black and white printing.

The Strengthening of the Chinese Defense Industrial Base

In addition to the doctrinal and operational evolution of the PLA's forces, the Chinese military industrial complex is modernizing to provide the weapon systems and components needed to achieve PLA objectives. While China still imports a host of systems from Russia and other partners to fill critical gaps in the short term, Chinese defense manufacturers increasingly are becoming able to develop indigenous systems with new capabilities.⁷⁹

Chinese leaders have adopted a "grand strategy" for the modernization of the defense industry.⁸⁰ This strategy calls for a three-pronged approach to accomplish a rapid defense industrial transformation: (1) selective modernization,⁸¹ (2) civil-military integration,⁸² and (3) acquisition of advanced foreign weapons and technologies.⁸³ The implementation of this three-pronged strategy as well as a number of structural changes in China's defense ministries and state-owned defense companies have continued to bring about positive developments for the Chinese defense industry.

Selective Modernization

China's leaders have recognized that the size of China's economy, although rapidly growing, and the general technological deficiency throughout the country, make it difficult and expensive to develop an indigenous capacity to produce advanced weapon systems across all sectors.⁸⁴ Thus, Chinese defense industries are giving priority to sectors that are critical to PLA strategic objectives.

Chinese shipyards are now building second-generation nuclear powered submarines, newly-designed frigates, and a large fleet of oil tankers to support naval operations in the event of a Taiwan conflict that would require carrying out blockade or sea lane denial missions, as well as delaying or deterring support from other countries. The shipyards also have the ability to produce replenishment vessels if they choose to do so.⁸⁵ In his testimony before the Armed Services Committee of the U.S. House of Representatives, then-Deputy Under Secretary of Defense Lawless highlighted two classes of submarines, the Jin and the Shang classes, as particularly good examples of the seriousness with which China's leaders view the role and military utility of a modern submarine fleet.⁸⁶ The first Jin-class nuclear powered ballistic missile submarine is still undergoing testing and is expected to be commissioned in 2008.⁸⁷ The two Shang-class nuclear powered attack submarines built by Huludao Shipyard, and designed with the help of Russian experts, are reported to have begun sea trials in 2005.⁸⁸ The recent launching or current production of these advanced, Chinese-built submarines indicates a rapid modernization of Chinese shipbuilding capabilities.

Additionally, Chinese shipyards are building modern destroyers and frigates. The Luzhou-class guided missile destroyer and Jiangkai II guided missile frigate complement China's improvements in submarine technology with enhanced anti-surface and anti-air capabilities—defense industry achievements also noted by Deputy Under Secretary Lawless.⁸⁹

As another part of its selective modernization component, the Chinese defense industry is capitalizing on China's strengths in the

aerospace and missile industries.⁹⁰ Space and counter-space capabilities have considerable implications for carrying out disruptive missions in Taiwan Strait contingencies, as well as other possible missions involving space-dependent adversaries. The United States would lose a significant technological edge if space-based assets were not available in such a conflict. Mr. Eric Hagt, Director of the China Program at the World Security Institute, explained China's interest in pursuing anti-satellite capabilities in his testimony before the Commission:

In the past decade, China has derived a number of key conclusions from its observations of U.S. military activities in space that have fundamentally shaped China's own strategic posture. The first is the profound implications of space for information and high-tech wars. China witnessed with awe and alarm the power of the U.S. military using satellite communication, reconnaissance, geo-positioning, and integration capabilities for an impressive show of force beginning first with the Gulf War in 1991, to the recent campaign in Afghanistan and Iraq. The U.S. military's almost complete dependence on space assets has not escaped the close examination of Chinese analysts. ASATs are seen by some analysts as weapons in line with China's asymmetric military strategy to hit enemies' vulnerable and hugely expensive assets in space with relatively cheap and easy countermeasures.⁹¹

In describing the importance that Chinese leaders attach to modernization of the aerospace industry, the 2007 *Military Power Report of the People's Republic of China* includes the following quote from Premier Wen Jiabao:

China's aerospace industry is standing at a new starting point and facing new situations and tasks ... It is now necessary to implement the principle of independent innovations; leaps in key areas ... carry out major state science and technology special projects in manned space flights and a lunar probe, and achieve new breakthroughs in research and development [of] aerospace equipment and ... space technology.⁹²

Chinese aerospace companies are now producing advanced imagery and reconnaissance satellites capable of military applications, and have plans to field satellites capable of infrared, multispectral, and synthetic aperture radar imaging.⁹³ Moreover, Chinese aerospace companies have developed and launched an indigenous navigation satellite constellation in which a group of carefully placed satellites working together provides a larger operational picture than any single satellite could provide. Four Beidou navigation satellites already have been launched over China and surrounding regions. The technology used in the satellites allows accuracy within 20 meters—a significant improvement in accuracy and precision over the capability of previous Chinese satellites.⁹⁴ Chinese aerospace companies also can take some credit for the success in recent years of China's manned space program. These firms will be tasked to provide the technology and hardware that will be used

in China's first space walk in 2007–2008 and China's first manned space station, scheduled to be launched in 2020.

In June 2007, the Commission received multiple briefings from the science and technology directorates of the Department of Defense and the military services at Wright-Patterson Air Force Base in Ohio addressing China's recent science and technology activities and accomplishments. The Commission learned that China graduates more than triple the number of bachelor of science-level engineers the United States graduates, and that Chinese research and development (R&D) has achieved world-class expertise in energetics, electronics, nanomaterials, optical communications, and metallurgy.^{95 96} (See additional material concerning China's science and technology progress in Section 3 ["China's Science and Technology Activities and Accomplishments"] of this Chapter.)

Civil-Military Integration

In addition to the selective modernization of key sectors, the Chinese defense industrial base also seeks to benefit from increased civil-military integration. Economic transfers in key civilian industrial sectors are contributing to the modernization of the defense industrial base and, in turn, to advances in China's military capability. Dr. Mulvenon describes this civil-military integration phenomenon within the context of what he calls a "digital triangle." In his testimony, he stated:

The pace and depth of [defense industry] advances cannot be explained by traditional Chinese defense-industrial dynamics, but instead spring from a paradigm shift known as the "digital triangle," which resembles a classic techno-nationalist strategy, with high-level bureaucratic coordination and significant state funding. The three vertices of the "digital triangle" are (1) China's booming commercial information technology companies, (2) the state R&D institute and funding infrastructure, and (3) the military. The linkages [among] these three vertices are longstanding, as telecommunications and information technology in China were originally under military auspices and the commercial relationships with state and military research institutes remain important.⁹⁷

The digital triangle phenomenon is facilitated further by two technological trends in China: the increasing utilization of commercial off-the-shelf (COTS) systems in military applications, and the ascent of China as a hub for global fabless integrated circuit production.⁹⁸ The digital triangle gives the PLA access to the advanced microelectronics that make up the core of modern military sensors and weapons systems.⁹⁹

Dr. Tai Ming Cheung, Research Fellow at the Institute for Global Conflict and Cooperation at the University of California/San Diego, identified several key advantages for both the civilian and defense sectors when they are closely connected.¹⁰⁰ He explained the thinking of Chinese leaders in deciding to adopt this approach:

The Chinese authorities view a strategy of embedding the defense industry within the broader civilian economy as

*playing a central role in supporting the long-term modernization of the country's military capabilities, especially in technological innovation, as well as in the development of the country's S&T establishment.*¹⁰¹

Deng Xiaoping's famous sixteen character declaration about the intertwining of civil and military spheres set this thinking in motion in the 1980s: "Combine the military and civil, combine peace and war, give priority to the military, and let the civil support the military." In the early 1980s, Chinese defense industries saw their entrance into the civilian market as a way to generate profits, but today defense companies see their participation in the civilian sector as their door to dual-use technologies and manufacturing expertise that can be grafted into their military production lines.¹⁰² Profits from commercial products manufactured by defense company subsidiaries are still seen as a valuable offset to government subsidies, and still comprise over 80 percent of defense industry aggregate output.¹⁰³ The Commission is submitting a classified report to Congress that will provide additional information on the state of China's S&T establishment and its accomplishments.

As noted in Chapter 1, Section 2 ("The Control of China's Economy by its Government, and the Effects on the United States"), the Chinese government is supporting certain key sectors to build up "national champions" and benefit from domestic economies of scale. Dr. Barry Naughton, Professor at the Graduate School of International Affairs at the University of California/San Diego, explained in his testimony before the Commission why the Chinese see civil-military integration as a favorable approach to military modernization:

*In the defense industry ... as in other aspects of technology policy, the Chinese have looked back over what they've done over the last couple decades and they've realized that many of their initiatives have failed. Moreover, in the defense industry, the record of the '80s and early '90s was pretty bad from their standpoint. So they have looked a lot at the U.S. and a lot at Japan, and they've recognized that they would be much better off with a vastly stronger civilian capacity that would strengthen their dual-use capabilities ... [T]hey've recognized that a sealed off, top-down command and control defense industry structure just isn't efficient enough to give them the kind of technological and security output that they want. So they've moved towards a much more open structure. There are a few important non-state-owned firms that have enough of a capability in high-tech sectors that they can start to provide dual-use items.*¹⁰⁴

Another area of growing cooperation between civilian and military sectors is between defense industries and civilian universities and research institutes. These partnerships provide a venue for transferring discipline-specific knowledge and educational training from civilian institutions to industry production lines. In 2002, the Commission of Science, Technology, and Industry for National Defense (COSTIND) gave several million renminbi to at least two aerospace and ship-building academies in Jiangsu Province to help cultivate their defense-related programs and to recruit students in-

terested in defense research.¹⁰⁵ While partnerships in aerospace and shipbuilding sectors are common, the area of greatest industry-university cooperation is in the information technology sector.¹⁰⁶

Acquisition of Foreign Equipment and Technology

The third prong of China's defense industrial base modernization strategy is to acquire advanced foreign equipment and technologies. While in some cases Chinese planners have chosen to purchase entire weapon systems directly, as they have done with many of the procurement agreements China has with Russia, some Chinese and Western analysts do not see this as beneficial for the long-term modernization of China's defense industry.¹⁰⁷ Direct purchases are generally used as a temporary measure to fill critical gaps that China's indigenous defense companies are unable to fill. Some items purchased from foreign companies are dual-use components—those that can be used in military as well as civilian applications such as computers, semiconductors, software, telecommunications devices, and integrated circuits.¹⁰⁸

Partnerships forged between foreign companies and Chinese civilian companies also offer Chinese defense industries access to advanced foreign technologies. The nature of the regulatory and commercial environment in China places enormous pressure on foreign companies, including those of the United States, to transfer technology to Chinese companies as a part of doing business in China and to remain competitive globally.¹⁰⁹ Foreign companies are willing to provide not only technology but capital and manufacturing expertise in order to secure market access in China.¹¹⁰

Even so, it is not always easy for Chinese companies to obtain some of the most advanced technologies found in industrialized nations. Export control laws in most advanced industrial nations strictly regulate the transfer of technologies identified as having national security implications, and companies in those nations are prevented from transferring the covered technologies to persons or organizations in other nations except under carefully specified conditions. In some of these cases, access to restricted foreign technology is obtained by China through industrial espionage; China operates an aggressive clandestine effort to acquire additional technologies.¹¹¹

In recent years, this has become such a problem in the United States that U.S. Immigration and Customs Enforcement officials have rated China's espionage and industrial theft activities as the leading threat to the security of U.S. technology.¹¹²

Recent Chinese Espionage Prosecutions in the United States

The first conviction under the Economic Espionage Act involved Fei Ye and Ming Zhong who were caught in 2001 attempting to transfer to China proprietary technology owned by two American companies.¹¹³ The two men set up a company in China, which, in exchange for a percentage of profits, was to receive local and provincial funding, in addition to funding that the two men expected to receive from the National High Technology Research and Development Program of China, commonly known as the “863 Program.”¹¹⁴

Defense contractor employee Peter Lee was found guilty in 1997 of transferring sensitive submarine tracking technology to Chinese scientists.¹¹⁵

Katrina Leung was an FBI double agent who was indicted in 2003 for transferring large quantities of classified FBI counter-intelligence information to China’s intelligence service, the Ministry of State Security. The case later was dismissed for prosecutorial misconduct.¹¹⁶

A chemist, Gary Min, was found to have obtained documents containing industrial secrets from his American employer. Court documents indicated that the company feared that the information would be highly valuable to Chinese companies. Min pled guilty to charges of stealing trade secrets in 2006.¹¹⁷

An engineer for an American defense contractor, Chi Mak, along with his wife, son, brother, and sister-in-law, was charged with conspiracy to export defense articles when he attempted to transfer U.S. Navy submarine engine secrets to China.¹¹⁸ When Mak’s house was searched, Chinese documents were discovered listing a number of sensitive U.S. naval systems and related technologies, including the submarine propulsion design technologies that he was caught attempting to take to China on encrypted disks.¹¹⁹

Xiaodong Sheldon Meng was an employee of an American software company who was convicted of selling to the PLA embargoed software used for U.S. Air Force and Navy training, and for attempting to sell proprietary technology to China’s Navy Research Center.¹²⁰ He installed the American military software, which he altered to give the appearance that it was developed by his new Chinese employer, on PLA computers. Meng, who will face sentencing in January 2008, was the first to be convicted for exporting proprietary software under the Arms Export Control Act and the second to be convicted under the Economic Espionage Act of 1996.¹²¹

The box above contains key information about several prosecutions for the illicit activities of persons obtaining technological information for the PRC. Successful prosecutions, however, are the exception; scores of other instances of espionage go unprosecuted or

undetected.¹²² All the while, the Chinese government staunchly maintains it is not involved in espionage and denies being engaged in any intelligence gathering against the United States.¹²³ Mr. Joel Brenner, the top counterintelligence official in the office of the director of national intelligence, has noted that of the 140 foreign intelligence agencies continuously attempting to penetrate U.S. agencies, China is the most aggressive.¹²⁴ The FBI stepped up counterintelligence efforts against Chinese intelligence operations in the United States in July 2007, because of what FBI Director Robert Mueller called a “substantial concern” about those operations.¹²⁵ As Chinese espionage against the U.S. military and American businesses continues to outpace the overwhelmed U.S. counterintelligence community, critical American secrets and proprietary technologies are being transferred to the PLA and Chinese state-owned companies.¹²⁶

Conclusions

- Several Chinese advances have surprised U.S. defense and intelligence officials, and raised questions about the quality of our assessments of China’s military capabilities.
- Chinese military strategists have embraced disruptive warfare techniques, including the use of cyber attacks, and incorporated them in China’s military doctrine. Such attacks, if carried out strategically on a large scale, could have catastrophic effects on the target country’s critical infrastructure.
- China has developed an advanced anti-satellite program consisting of an array of weapons that could destroy, damage, or temporarily incapacitate an adversary’s satellites. The use of high energy lasers to temporarily blind U.S. satellites in late 2006 and the use of a direct-ascent anti-satellite kinetic weapon to destroy an aging Chinese satellite in early 2007 demonstrate that China now has this capacity.
- The Chinese defense industry, while still lagging far behind that of the United States, has begun achieving noteworthy progress over the past years. New generations of warships, fighter aircraft, spacecraft, submarines, missiles, and other sophisticated weapon platforms are coming off production lines at an impressive pace and with impressive quality.
- The pace at which each of China’s defense industrial sectors is modernizing varies in direct proportion to its degree of integration in the globalized production and R&D chains, because such integration provides access to the most up-to-date technologies and manufacturing expertise.
- China is supplementing the technologies that its defense industry obtains through commercial transfers and direct production partnerships with an aggressive and large-scale industrial espionage campaign. Chinese espionage activities in the United States are so extensive that they comprise the single greatest risk to the security of American technologies.

SECTION 2: CHINA'S PROLIFERATION

“The Commission shall investigate and report on—

“PROLIFERATION PRACTICES—The role of the People’s Republic of China in the proliferation of weapons of mass destruction and other weapons (including dual-use technologies), including action the United States might take to encourage the People’s Republic of China to cease such practices.

“ECONOMIC TRANSFERS—The qualitative and quantitative nature of the transfer of United States production activities to the People’s Republic of China, including the relocation of high technology, manufacturing, and research and development facilities, the impact of such transfers on United States national security, the adequacy of United States export control laws, and the effect of such transfers on United States economic security and employment.

“REGIONAL ECONOMIC AND SECURITY IMPACTS—The triangular economic and security relationship among the United States, [Taiwan], and the People’s Republic of China (including the military modernization and force deployments of the People’s Republic of China aimed at [Taiwan]), the national budget of the People’s Republic of China, and the fiscal strength of the People’s Republic of China in relation to internal instability in the People’s Republic of China and the likelihood of the externalization of problems arising from such internal instability.”

Introduction

In his testimony before the Commission, Ambassador Donald Mahley, Acting Deputy Assistant Secretary of State for Threat Reduction, Export Controls, and Negotiations, defined proliferation as “the spreading or transfer of capabilities or the technology and knowledge to support capabilities of the production of weapons of mass destruction, but also of the enhancement of military capabilities to areas that did not previously possess [them] and particularly in which we do not have a clear indication [they] will be responsibly used once ... acquired.”¹²⁷ In this sense, China’s relationships with and military sales to several states, notably including Iran, North Korea, Burma, and Sudan, raise fears not only about the spread of weapons of mass destruction (WMD) but also about the continued proliferation of advanced conventional weapons and technology that could destabilize regions throughout the world. Additionally, given China’s willingness to use weapons and force

against its own populace, China's close relationships with and arms sales to governments that are willing to do the same against their populations are sources of concern.

In the 1990s, China actively proliferated weapons and technology related to WMD and their delivery systems. While most experts acknowledge that China's overt state-to-state proliferation has diminished, Administration officials testified before the Commission that China's nonproliferation record is "mixed," noting that some Chinese businesses and individuals continue to seek opportunities to proliferate.¹²⁸ Deputy Assistant Secretary of Defense for East Asia David Sedney stated, "Chinese businesses, including state-owned enterprises, those that have close relations to PRC officials, and those without government ties, continue to supply items and technology useful in weapons of mass destruction, their means of delivery, and advanced conventional weapons programs, often when these items are not explicitly on international [export control] lists."¹²⁹ The continued imposition of U.S. sanctions on Chinese companies underscores this claim. In addition, officials noted that China's often unbridled proliferation of conventional weapons—not governed by multilateral or bilateral commitments made by China—does not support China's bid to be recognized as a responsible stakeholder and promoter of peace and stability in the international community.¹³⁰

China's Nonproliferation Policies and Commitments

Since the 1990s, China has adjusted its policy regarding proliferation. It has signed and ratified a number of international nonproliferation agreements, and also has taken a number of steps to institutionalize a system of export controls to monitor and limit the transfer of weapons and weapons technology.

Most, if not all, Chinese companies that have been sanctioned by the United States are state-owned. Nonetheless, when Chinese state-owned companies are caught proliferating, the central government routinely claims that these companies are operating without government authorization or knowledge. There are more than 30,000 officers in China assigned to police the Internet for ideological purity.¹³¹ In contrast, a training program is being completed for only 5,000 export control and border security officials whose work is key to preventing Chinese proliferation.¹³²

China's current official policy toward proliferation is stated in its White Paper, *China's National Defense in 2006*:

*China is firmly opposed to the proliferation of weapons of mass destruction and their means of delivery. It supports the United Nations in playing its due role in non-proliferation. China is a party to all international treaties on non-proliferation and related international organizations. It has established a complete legal regime for controlling the export of nuclear, biological, and chemical weapons, missiles and other related sensitive items and technologies, and all defense items. China follows strict procedures in approving exports, to ensure effective export control.*¹³³

Additionally, the Beijing government "... believes that countries may cooperate in the peaceful use of nuclear energy under the premise of observing their international obligations and that relevant cooperation should help safeguard and strengthen the principles and effectiveness of the international nonproliferation mechanism."¹³⁴

China's ratification of multilateral nonproliferation treaties has created obligations for China not to employ weapons of mass destruction (WMD) and to engage in efforts to prevent the spread of WMD technology, materials, and delivery systems. Below is a summary of China's participation in multilateral regimes and the principal commitments China consequently has or has not made:

Table 2.1 China's Nonproliferation Commitments

Nonproliferation Regime:	Description:	China's Response:
Biological Weapons Convention (BWC)	Outlaws the production, development, storage and use of biological weapons.	China acceded to the BWC in 1984.
Chemical Weapons Convention (CWC)	Outlaws the production, storage, and use of chemical weapons.	China signed the CWC in 1993, and ratified in 1997.
Nuclear Nonproliferation Treaty (NPT)	The five original nuclear states (France, China, USSR (now Russia), the United Kingdom, and the United States) agree not to use nuclear weapons against non-nuclear states except in response to a nuclear attack, and to prevent the transfer of nuclear weapons to non-nuclear states; and affirm the right of states that do not possess nuclear weapons to use peaceful nuclear technology.	China acceded to the NPT in March 1992.
Zangger Committee	Provides for maintenance of a list of equipment that may be exported by members only to facilities that have nuclear safeguards in place, and fosters coordination among states for the export of nuclear materials.	China joined the Zangger Committee in 1997.
Nuclear Suppliers Group (NSG)	Controls the export of materials that may be used for nuclear weapons development.	China joined the NSG in May 2004.

Table 2.1 China's Nonproliferation Commitments—Continued

Nonproliferation Regime:	Description:	China's Response:
Comprehensive Test Ban Treaty (CTBT)	Each party agrees to prohibit "... any nuclear weapon test explosion or any other nuclear explosion, and to prohibit and prevent any such nuclear explosion at any place under its jurisdiction or control," and to "... refrain from causing, encouraging, or in any way participating in the carrying out of any nuclear weapon test explosion or any other nuclear explosion." ¹³⁵	China signed the CTBT in September 1996, but has not ratified the treaty. (The United States is a signatory, but also has not ratified the treaty).
Container Security Initiative (CSI)	Establishes port security programs with cooperating countries to identify and screen suspect cargo containers destined for the United States in order to prevent these containers from being used by terrorists to deliver weapons, especially WMD, to the United States.	Two ports in China, Shanghai and Shenzhen, and also the port of Hong Kong, participate in the CSI.

Table 2.2 Major International Nonproliferation Efforts in which China Is Not a Participant

Nonproliferation Regime:	Description:	China's Response:
Missile Technology Control Regime (MCTR)	Provides a "set of voluntary guidelines ... to control the transfer of ballistic and cruise missiles that are inherently capable of delivering at least a 500 kg (1,100 lb) payload a distance of at least 300 km (186 mi)." ¹³⁶	China affirmed its commitment to the MCTR with an October 1994 joint statement with the United States. China is not yet a member, but has applied for membership. ¹³⁷

Table 2.2 Major International Nonproliferation Efforts in which China Is Not a Participant—Continued

Nonproliferation Regime:	Description:	China's Response:
Australia Group	Enables participating members to harmonize their export control regimes to "ensure that exports of certain chemicals, biological agents, and dual-use chemical and biological manufacturing facilities and equipment, do not contribute to the spread of [chemical and biological weapons]." ¹³⁸	China is not a member, but has applied for membership. ¹³⁹
Proliferation Security Initiative (PSI)	Members cooperate to interdict and inspect ships on the open seas suspected of transporting WMD and related goods.	China has not joined, voicing concerns about PSI's legality.
International Code of Conduct Against Ballistic Missile Proliferation	This Code is intended to supplement the MTCR, but is not restricted to MTCR members. States commit to ending the proliferation of WMD-capable ballistic missiles, to exercise restraint in developing and testing such technology, and to participate in transparency measures such as annual declarations of missile and space launch programs. ¹⁴⁰	China has not joined.
Wassenaar Arrangement	Establishes lists of dual-use goods and technologies and conventional arms for which members are to develop export controls in order to promote transparency and greater responsibility in international transfers of such arms, goods, and technologies. ¹⁴¹	China is not a member.

Ambassador Mahley noted that while China has applied for membership in the Missile Technology Control Regime (MTCR) and the Australia Group, those groups are not yet convinced that China has established sufficiently extensive and rigorous nonproliferation commitments and controls, and the means to enforce these, to merit its acceptance as a member. ¹⁴²

China's Proliferation-related Laws and Regulations

To meet the international nonproliferation commitments it has made, China has promulgated proliferation-related laws and regulations—primarily addressing the design of China's export control system and enforcement of its restrictions. In the wake of the September 11, 2001 attacks and the rising threat that rogue states and non-state actors will obtain WMD, China issued new export control regulations in 2002. These regulations require companies that sell controlled items to obtain a license and government approval for each sale, along with a guarantee from the purchaser that the item or technology will not be misused.¹⁴³ Within the government, the Ministry of Commerce holds primary responsibility for licensing and regulating the sale of sensitive items and technologies, including dual-use items and technologies. However in cases applying to PLA sales, the General Armament Department, responsible for military equipment and production of armaments, holds responsibility and controls access to these materials.¹⁴⁴ In some cases, companies are permitted to sell surplus arms from PLA depots, but cannot contract with brokers to sell weapons directly from the production line.¹⁴⁵ The final authority on export control enforcement is the State Council.¹⁴⁶

In an attempt to strengthen public and industry awareness of prohibited items and technologies, in January 2004, China issued an export-licensing catalog—a list of sensitive items and technologies prohibited from export, including missile technologies and equipment.¹⁴⁷ In November and December 2006, the State Council approved two sets of revised export control regulations that harmonized export controls related to nuclear exports with Nuclear Suppliers Group standards, and increased punishments for violations.¹⁴⁸ These controls include software contained in the multilateral control list that pertains to nuclear weapons development and manufacture. These regulations also require that a commitment be obtained from the entity importing these items that it will neither reproduce the nuclear goods or technologies it receives for export nor transfer them to a third party.¹⁴⁹ Also, the State Council introduced “‘permanent measures’ on licensing dual-use items and technology trade that specifically contain language that could be viewed as expansion of ‘catch all’ controls in China.”¹⁵⁰

A University of Georgia Center for International Trade and Security report concludes, “The promulgation of new legal authorities for export control in 2002, recent institutional reforms and improvements, and increasing integration with the multilateral export regimes have gone a long way toward closing what once seemed a persistent gap between Chinese and international export control standards.”¹⁵¹ In May 2004, the Ministry of Commerce fined two Chinese companies for violations.¹⁵²

China's Implementation of Its Domestic Laws Is Insufficient to Meet Its International Nonproliferation Commitments

Ambassador Mahley testified that China has included items on export ban lists that parallel those specified by international nonproliferation regimes. However, it remains unclear the extent to which China will implement and enforce these laws and regulations.¹⁵³ Deputy Assistant Secretary Sedney noted in his testimony

that China has not demonstrated the national level commitment required to achieve the changes it has promised.¹⁵⁴ Chinese agencies tasked with customs and export control responsibilities are understaffed.¹⁵⁵ Furthermore, Dr. Brad Roberts of the Institute for Defense Analyses testified that, "... it's clear that different parts of the Chinese government and state apparatus bring different levels of enthusiasm to the policing of the behaviors of state entities with regard to China's commitments."¹⁵⁶

China provides insufficient training for its customs and export control officials, its capacity to regulate border traffic is weak, and problems in its judicial system make it difficult to prosecute violations successfully.¹⁵⁷

One successful example in China's enforcement of its domestic laws is the arrest of four men from Hunan province for attempting to sell "yellowcake" uranium¹⁵⁸ acquired through an illegal mining operation. They were apprehended during a sting operation conducted by Chinese authorities, and currently are on trial.¹⁵⁹

China's Approach to its Nonproliferation Commitments

In his testimony, Dr. Roberts stated that China's approach to proliferation has changed in recent years to align more closely with international norms and U.S. expectations. However, he noted that a significant gap remains.¹⁶⁰ Dr. Roberts testified that this gap stems from a different interpretation of what multilateral and bilateral agreements require, and explained that the Chinese government thinks the United States has asked it to go beyond the literal requirements of the treaty regimes to which it is a party.¹⁶¹ China views the United States as asking China to address its proliferation problems according to the "spirit of the law," which addresses intent to abide by the commitment to halt proliferation, in addition to fulfilling the actual provisions of the agreements. China takes a legalistic approach that acknowledges the literal requirements of its commitments—that is, the "letter of the law." It has not adopted a fundamental change in perspective toward the issue of proliferation and a determination to recognize and halt its harmful consequences.¹⁶²

On the issue of conventional weapons transfers, the United States is concerned that China's sales to Iran and other nations will have a destabilizing effect on global security and are not in the interests of either the United States or China. However, China has made no bilateral or multilateral legal commitment to restrict such transfers and no prohibition pertains.¹⁶³ Deputy Assistant Secretary Sedney told the Commission that China's legalistic approach, which requires the minimum amount of effort, does not support China's claim to be a responsible world power. In fact, "the standard [the Chinese] have set for themselves by those claims [that China is a responsible stakeholder] are called into question by the activities that they carry on in the conventional sphere with Iran."¹⁶⁴

Moreover, two of the world's most troubling nuclear threats—North Korea and Iran—received technology and equipment from China either directly or indirectly that aided their efforts to develop nuclear weapons and weapons technology. Questions remain

about the extent of China's knowledge of, and assistance to, North Korea's nuclear weapons program, but the U.S. government has disclosed that North Korea received most of its equipment and technology from Pakistan, a country to which China directly supplied nuclear technology.¹⁶⁵

After acceding in 1992 to the Nuclear Nonproliferation Treaty (NPT)—which obligates signatories to prevent the spread of nuclear weapons to non-nuclear states but does not define violative acts—China continued to assist Iran to develop nuclear reactors and enrich uranium despite concerns that Iran may be developing nuclear weapons.¹⁶⁶ China does not appear to have violated its commitments under the NPT.¹⁶⁷ It is unclear, however, whether China has fulfilled its obligations under recent U.N. Security Council Resolutions directed against Iran that prohibit transfers of military- and nuclear-related items.¹⁶⁸

China also has been aiding Pakistan in the construction of its second nuclear power plant. According to Mr. Chaim Braun, a Science Fellow at the Center for International Security and Cooperation at Stanford University,

*China [became] a member of the [Nuclear Suppliers Group] in 2004, and as a member is forbidden by NSG Guidelines from supplying nuclear equipment to countries that did not sign the NPT and did not accept full scope safeguards. However, China claims that its contract negotiations with Pakistan regarding [this] construction have been ongoing even before its accession to NSG membership, and are thus 'grandfathered' [and therefore exempt] from its NSG obligations.*¹⁶⁹

Understanding China's approach to nonproliferation, and specifically to the legal commitments of its nonproliferation agreements, is important for understanding the utility of nonproliferation agreements with China. Ambassador Mahley testified, "What you're trying to do is to put in place a framework by which [China] can find ... means to operate in an acceptable fashion for the international community and for joint interests ... So, in that sense, another agreement is useful because it gives the Chinese something in language which they've agreed to ... which they can now use as a means of dictating their behavior."¹⁷⁰ According to this view, if China joins another nonproliferation regime such as the MTCR, the very least the international community can expect is for China to abide by the letter of that agreement, and perhaps, as Ambassador Mahley indicated in his testimony, this may be an improvement on China's past behavior.¹⁷¹ Another option is placing language in such agreements that broadens China's commitment, and therefore requires an expansion of its efforts. For example, including requirements in future nonproliferation agreements with China that it establish "catch-all" provisions in its domestic laws potentially would produce a ban on transfers by China to a particular place of concern, even if China has not included particular items of concern on its control list.¹⁷²

China's Proliferation Practices

In his testimony before the Commission, Mr. Joseph Cirincione, Vice President for National Security at the Center for American Progress, argued that "... while there are serious issues with China's commitment to the international nonproliferation regimes, in general the trends are positive. [Its] performance has improved dramatically in recent decades, and ... the issues that we have are manageable and can be worked out by a policy of constructive engagement with China."¹⁷³

Ambassador Mahley also acknowledged some positive developments.¹⁷⁴ China "has acknowledged that the acquisition of nuclear weapons by Iran and North Korea is not in [its] interest,"¹⁷⁵ and has supported U.N. resolutions to sanction Iran and North Korea for their illicit nuclear activities. (Each resolution was the subject of intense debate, and China supported them only after Chinese representatives worked successfully to weaken their punitive measures.)

According to Ambassador Mahley, China has demonstrated in some ways a new willingness to address nonproliferation concerns¹⁷⁶—for example, playing a positive role in securing North Korea's participation in the Six-Party Talks to obtain a suitable resolution to that nation's nuclear program and weapons. After North Korea test fired missiles in July 2006, the U.N. Security Council responded with Resolution 1695 imposing targeted punitive sanctions against North Korea and requiring states, in a manner consistent with their own laws, to prevent transfers of materials, goods, technology, and financial resources in relation to North Korea's missile or WMD programs.¹⁷⁷ China voted in favor of the resolution only after it worked successfully to obtain removal of language that imposed the sanctions under the authority of the Security Council.¹⁷⁸

When North Korea announced in October 2006 that it had conducted a nuclear test, and the U.N. Security Council considered Resolution 1718 that included a provision calling on states to take "cooperative action including thorough inspection of cargo to and from the DPRK as necessary,"¹⁷⁹ China voted to approve that resolution as well. Throughout the diplomatic process, China's support was contingent upon weakening the enforcement mechanisms and criticisms contained in the resolutions proposed by the United States and Japan.¹⁸⁰ Deputy Assistant Secretary Sedney testified that North Korea's nuclear and missile tests called to China's attention that its past tolerance of North Korea's provocative behavior had "eroded the very stability [in the region and on China's borders that China] claims to seek."¹⁸¹ While China and the United States had some very different motivations for negotiating with North Korea in the Six-Party Talks, the two nations share sufficient common ground to try to work together to address North Korea's nuclear activities.

The Six-Party Talks and North Korea's Nuclear Program

It appears possible as this report is being finalized that the year 2007 will be seen as an important year in the Six-Party effort to obtain an agreement from North Korea to halt its nuclear program and dispose of its nuclear weapons, and then to fulfill that agreement. On February 13, 2007, the six parties signed an Initial Action Agreement that intends to fulfill the requirements of the September 2005 Agreement that was dormant for more than a year. In announcing the agreement, Secretary of State Condoleezza Rice specifically thanked China for its role in the negotiations,¹⁸² and later in that same month, Ambassador Christopher Hill, the U.S. lead negotiator for the Talks, expressed the view that China has been a vital partner for the United States in this process. Furthermore, in his testimony to the Commission, Ambassador Mahley testified that Chinese support is "absolutely essential" to the fulfillment of those February 13 commitments.¹⁸³ However, these laudatory statements may have been made more to serve diplomatic purposes than to clarify the historical record. Mr. Sedney testified that although China has taken concrete steps in pursuit of denuclearizing North Korea, there are more steps that China can and should take.¹⁸⁴

Despite 30-day and 60-day action timelines specified by the February 13 agreement, North Korea stalled on fulfilling its commitments by asserting it would not implement the agreement until the United States released funds the U.S. Department of Treasury froze in September 2005 based on charges they were associated with illicit activities. In March 2007, the Department of Treasury announced that the United States and North Korea had reached an agreement on the frozen funds.¹⁸⁵ This agreement required communication and coordination of policies with Macanese and Chinese authorities. In June, North Korea announced it was ready to begin shutting down its Yongbyon reactor, and International Atomic Energy Agency (IAEA) inspectors arrived to begin negotiating those processes.¹⁸⁶ In September, China delivered its first shipment of fuel oil to North Korea as part of its commitments.¹⁸⁷

In December 2006 and March 2007, China voted to approve U.N. resolutions 1737 and 1747, respectively, addressing Iran's nuclear activities. Resolution 1737 imposed sanctions on Iran for failing to halt its uranium enrichment program following the adoption of Resolution 1696 in July 2006. Specific sanctions included banning supply of nuclear-related materials and technology to Iran, and freezing the assets of key individuals and companies related to the enrichment program.¹⁸⁸ Resolution 1747 tightened the sanctions that had been placed on Iran for failing to halt its nuclear enrichment program. The resolution strictly prohibited procurement of arms from Iran by U.N. member nations and their nationals, and selling or transferring to Iran military-related equipment and other materials that would aid Iran in the accumulation of arms.¹⁸⁹ The resolution also expanded a preexisting freeze of assets related to

the enrichment program. Additionally, the resolution encouraged state and international financial institutions not to provide funds to Iran, except for humanitarian or development aid.¹⁹⁰

Continued Proliferation in Violation of China's Policy and Commitments

Concern about China's proliferation activities remains. The Administration has labeled China's nonproliferation record "mixed," noting that some Chinese businesses and individuals continue to seek opportunities to proliferate and sell items that are contrary to the government's official commitments.¹⁹¹

With regard to North Korea, China has adopted a risk-averse strategy that appears to place a greater value on maintaining stability on the Korean peninsula than on aggressively pursuing denuclearization.¹⁹² China has been the leading provider of food, fuel, and trade outside the provisions of the February 13 agreement, and this lessens the impact of international pressure on North Korea through the Six-Party process.¹⁹³ China has not implemented a ban on exporting luxury goods to North Korea as Resolution 1718 requires.¹⁹⁴ Deputy Assistant Secretary Sedney testified that Chinese firms are the sources of dual-use items for North Korea that can be used by North Korea's missile-related programs.¹⁹⁵ Ambassador Mahley noted that China generally accepts without question or skepticism end-use guarantees from North Korea; this enables China to sell arms to North Korea while complying with China's export control requirements for such sales.¹⁹⁶ This practice could result in the transfer of weapons or technology to North Korea that could destabilize the military balance on the Korean peninsula and further entrench that regime's dictatorship. Additionally, China has allowed North Korea to use its ports and airfields for transshipment of military-related items to Iran and other countries of concern.¹⁹⁷

China has continued to sell weapons to Iran, notwithstanding evidence Iran is supplying and funding terrorist groups in Iraq, Lebanon, and Afghanistan, and is seeking to destabilize the Middle East.¹⁹⁸ Deputy Assistant Secretary Sedney testified,

We have repeatedly asked China to stop its transfers to Iran of conventional weapons and technologies. China's response that these transfers are not governed by any international regime or treaty and therefore are "allowed," is irresponsible and is at odds with the statements by Chinese leaders that China is prepared to be responsible and seeks a cooperative partnership with the United States. Partners do not provide weapons to people who support those who kill our troops and those of our allies.¹⁹⁹

Ambassador Mahley testified that since the passage of U.N. Resolutions 1737 and 1747, China has made some unspecified transfers that the United States believes violated the terms of those resolutions and aided Iran's nuclear program. China acknowledges that the transfers took place, but offers as justification its view that the United States is wrong in its assertion that the U.N. resolutions ban these items.²⁰⁰ China also has helped Iran establish

self-sufficient production of ballistic missiles. The United States has communicated to China that China could much more effectively support the objectives of the international efforts opposed to Iran's nuclear program if it suspends its investments in Iran's oil and gas sectors in order to bring more financial pressure on the Iranian government.²⁰¹

China also continues to transfer conventional arms and dual-use technologies to Sudan,²⁰² despite U.N. resolutions prohibiting the sale or supply of weapons and military equipment to belligerents in the Darfur conflict.²⁰³ These sales suggest that China places greater emphasis on its commercial and energy supply interests than on concerns about human rights or international opprobrium.²⁰⁴ Deputy Assistant Secretary Sedney stated,

*China is a major supplier of arms to Sudan, weapons that are important to a Sudanese military that supports actions in Darfur that are causing immense human suffering and threaten the stability of that region of Africa. China is seen as Khartoum's primary patron and benefactor. While China has declared its intent to restrict arms sales to uses outside Darfur and appointed an envoy for Darfur, we are concerned that China is not using the full weight of its relationship with Sudan to stop the suffering in Darfur and bring Khartoum into compliance with international norms.*²⁰⁵

Ambassador Mahley acknowledged that the appointment of a special Chinese envoy to Sudan may hold some promise that China will begin to use its influence there to push the Khartoum government to resolve the conflicts in that country and comport its actions responsibly.²⁰⁶ China's contribution of troops to the U.N.'s peacekeeping force in Sudan raises new but limited expectations for China's participation in addressing international humanitarian crises.²⁰⁷

Limits to Chinese Implementation and Compliance

In spite of China's multilateral and bilateral nonproliferation commitments, and its own domestic laws, there have been repeated episodes of Chinese proliferation. Because of the opacity of China's government, it generally is difficult or impossible to know whether (1) the government objects to such transactions but is either unaware of them or powerless to stop them; (2) the transactions result from government acquiescence fostered by entrenched corruption; or (3) the government approves of the transactions in direct contravention of its official policy and commitments. There is evidence that many illicit transactions are not accidental. Ambassador Mahley told the Commission that Chinese companies have developed more complex front organizations to disguise transfers that are contrary to official policy.²⁰⁸

Dr. Roberts noted that enforcement of export restrictions may differ depending on the political influence a particular company is able to exert.²⁰⁹ Dr. Jing-dong Yuan of the James Martin Center for Nonproliferation Studies testified that because of the structure of many Chinese companies that produce weapons and technology

for export and their current or past relationship with the People's Liberation Army (PLA) as state-owned entities, it is difficult for export control officers to challenge export decisions that appear to be approved by company leaders or government or PLA officials.²¹⁰

Indeed, in any export control system, companies necessarily play a critical role. As Dr. Gary Bertsch, university professor, and founder and Director of the Center for International Trade and Security at the University of Georgia/Athens, told the Commission, "Industry is the first line of defense in restraining proliferation."²¹¹ Export controls cannot be effectively implemented, administered, and enforced without knowledgeable commitment by a nation's manufacturers and traders.

China has lagged in this dimension. Some suggest that China has recognized this problem and is taking steps to address it—motivated in part by international opprobrium, and by the economic costs of sanctions imposed by the United States and others. A case in point is the China North Industries Corporation (NORINCO) that has been designated "one of the greatest serial proliferators in China."²¹² Recently, NORINCO has claimed it is undergoing a transformation brought about by the realization that "responsible export control behavior, informed corporate officials, and an effective internal compliance program can be thought of as trade-enabling," according to Dr. Bertsch,²¹³ with whose organization NORINCO has contracted for export control training for its employees and assistance in developing an internal compliance program.²¹⁴ Dr. Bertsch maintains NORINCO's transformation is real, and stems from the company's desire to avoid stigma and U.S. sanctions, and to open new opportunities for trade with U.S. companies. The jury is out, however. Ambassador Mahley agreed this change in rhetoric demonstrates that sanctions create economic incentives to change negative behavior, but also said that it is yet to be determined whether NORINCO actually has changed its behavior or simply is seeking to mask harmful behavior behind positive rhetoric.²¹⁵

Because of China's inadequate proliferation record, Congress has required the executive branch to report on China's nonproliferation treaty compliance and to sanction firms and individuals who violate U.S. nonproliferation laws.²¹⁶ For example, the Iran and Syria Nonproliferation Act was amended in 2006 to include sanctions against persons or companies who transfer weapons and technology to North Korea.²¹⁷ The continued imposition by the U.S. government of sanctions against Chinese firms offers stark evidence that Chinese political will to enforce export control restrictions satisfying international norms, or its technical enforcement apparatus, is deficient.²¹⁸ Ambassador Mahley told the Commission that he is not satisfied that the sanctions in current law inflict sufficient pain on proliferating entities, and that in the case of entities that do little or no business with or in the United States, the sanctions have little or no effect. However, some experts believe that as Chinese firms extend their activities around the globe, they likely will want increased access to U.S. markets, and therefore will conform to nonproliferation norms in order to gain new economic opportunities and avoid sanctions. Indeed, this is the motivation NORINCO cites for its purported proliferation reversal.²¹⁹

Table 2.3 List of Sanctions Imposed on Chinese Entities Since November 2006^{220,221}

Date	Entity/Person	Controlling Statute
December 2006	<ul style="list-style-type: none"> • China National Electronic Import-Export Company • China Aero-Technology Import/Export Corporation (CATIC)²²² • Zibo Chemet Equipment Company 	Iran/Syria/North Korea Nonproliferation Act
April 2007	<ul style="list-style-type: none"> • China National Precision Machinery Import/Export Corporation (CPMIEC)²²³ • Shanghai Non-Ferrous Metals Pudong Development Trade Company, Ltd. • Zibo Chemet Equipment Company 	Iran/Syria/North Korea Nonproliferation Act

Engaging China to Strengthen Its Nonproliferation Efforts

Multilateral Efforts

Experts appearing before the Commission expressed different views on the benefits of working to expand China's participation in multilateral nonproliferation regimes and programs. Dr. Roberts suggested that it is a "chicken-and-egg" problem to decide whether regimes whose member nations share views on objectives and methods and have achieved a reasonable level of proficiency in application should accept China as a member first and then try to obtain its agreement to the objectives and methods and facilitate its proficiency, or instead should demand demonstrated agreement and proficiency before granting membership. He testified that China's general practice when joining nonproliferation activities is to comply with the letter of the law—if that—but often not the broader spirit. He suggested that complying with only the letter of the law frequently is insufficient, and that China's shortcomings in this respect are harmful to U.S. nonproliferation efforts.²²⁴ Dr. Yuan suggested that greater consultation with multilateral regimes in which China is seeking membership, such as the Australia Group, can inform China of what is expected of members, and once China moves close enough to meeting those expectations, the regime can accept China and expect further improvements.²²⁵ This position parallels that of Deputy Assistant Secretary Sedney, who said that China must improve its enforcement of nonproliferation controls and its transparency about those activities so as to engender trust, at which point the United States would be more comfortable supporting China's membership in organizations like the MTCR.²²⁶

One method to expand the appeal of multilateral controls is to work to establish and gain acceptance of and adherence to "no undercut" policies: An exporting nation notifies its allies, or other nations participating in a multilateral export control regime, of its disapproval of a request to export an item to a particular nation or end-user, and requests its partners also to deny similar requests from the same nation or end-user, so as not to "undercut" the original nation's denial of the export. This policy advances the interests of nonproliferation—making it less likely the end-user seeking the denied item will obtain it elsewhere—and the interests of the com-

pany from which the purchasing organization originally sought to purchase the item because it does not lose the sale to a company in another nation.

China and the Proliferation Security Initiative

The United States founded the Proliferation Security Initiative (PSI) in 2003 to organize nations concerned about shipments of WMD and their delivery mechanisms to identify suspected shipments and interdict them. Although China was invited to participate, it has not done so, citing concerns that international law does not permit seizure of ships, even those suspected of carrying WMD or their components or delivery systems, on the open seas.^{227 228}

Ambassador Mahley testified, “China’s commitment and participation in this program would be invaluable and we have been seeking to address Beijing’s concerns, emphasizing that PSI actions are taken in accordance with states’ domestic authorities and international law.”²²⁹

Bilateral Efforts

Nonproliferation is a very important matter for the United States, and it has engaged in repeated discussions with China on this topic at levels ranging from summits to the working level.²³⁰ The topic was addressed during President Hu Jintao’s visit to the United States in April 2006. There is a periodic Nonproliferation Dialogue conducted at the Assistant Secretary level.²³¹ The U.S. Department of Energy has engaged China on nuclear security issues,²³² and China participates in the U.S. Container Security Initiative (CSI).

China, Hong Kong, and the Container Security Initiative (CSI)

Background

The CSI was initiated in 2001 after the September 11 attacks to reduce the risk that a terrorist could use a shipping container to transport weapons of mass destruction (WMD) or weapons of mass effect (WME) directly into the United States.²³³ In this program, participating ports work with officials of Customs and Border Protection of the U.S. Department of Homeland Security to identify containers determined to pose a high risk of containing WMD or WME, prescreen them before the ships carrying them depart for the United States, and, in some cases, physically examine their contents. Participation in the program is negotiated through voluntary bilateral agreements.²³⁴ Prior to initiating the program at a port, U.S. Customs and Border Protection, the U.S. Department of Energy, the U.S. Department of State, and the U.S. Coast Guard conduct a capacity assessment to determine any weakness in controlling the flow of shipping and preventing the port from being used to transfer weapons undetected.

China's Participation in the CSI

In September 2007, CSI officers in Washington, DC provided a briefing to the Commission on China's participation in CSI. As of October 2007, the mainland ports of Shanghai and Shenzhen are participating in the CSI. The Declaration of Principles that established U.S.-China CSI cooperation allows for scanning only containers determined to be possibly related to an imminent terrorist threat. Scanning containers for other transgressions—such as possible intellectual property infringements—is not part of the CSI program, and is not allowed by Chinese customs officials.

There have been some areas of friction in the program's operation. In some instances, the U.S. and Chinese determinations of the risk posed by a container have been different, but Chinese customs officials generally have been willing to permit the CSI team to scan containers it has identified as risky and to participate in the scanning process. When a physical inspection has been indicated, U.S. CSI personnel have received good cooperation from their Chinese counterparts. China permits U.S. customs officers working in the program to reside and work in China for only one year.

The U.S. government's overall assessment of China's participation in the CSI program is positive, and that the program's operation in Shanghai and Shenzhen materially contributes to the security of the United States.

**China, Hong Kong, and the Container Security Initiative
(CSI)**

Hong Kong's Participation in the CSI

In June 2006, when a Commission delegation visited Hong Kong, it met with U.S. and Hong Kong customs officials who work on the CSI program at the Hong Kong Port. Hong Kong's customs operations, including those pertaining to CSI, are not controlled by the PRC, and its officials work with the U.S. government on the CSI under a separate agreement. U.S. CSI officials can reside and work in Hong Kong indefinitely, unlike in China. According to U.S. CSI personnel, Hong Kong is considered to be one of the program's best success stories.

Export Control Technical Assistance to China

In April 2006, the U.S. Department of Commerce and China's Ministry of Commerce formed the "U.S.-China High Technology and Strategic Trade Working Group" under the auspices of the Joint Commission on Commerce and Trade (JCCT), which is a Ministerial-level bilateral working group. Among the topics the Working Group has addressed is export control cooperation, including U.S. sponsorship of technical assistance to China to assist it to strengthen and increase the effectiveness of its export control program. In 2004, the Department of Commerce and the Ministry of Commerce also signed an agreement on end-use verification of adherence to export control license conditions. The first such agreement on end-use verification was established in 1998, after 15 years of negotiation.²³⁵ Ambassador Mahley told the Commission:

Beyond discussing our shared interest in preventing proliferation, there are a number of instances where the Chinese have expressed an interest in export control cooperation, including technical exchanges and training. To the extent that it is permissible within the law, we have endeavored to provide such assistance.

One such example of cooperation is found in the State Department's Export Control and Related Border Security (EXBS) Program, which has supported training for Chinese licensing and enforcement officials. The EXBS effort is designed to help key source, transit, and transshipment countries to establish or enhance strategic trade control systems, including border control capabilities, that meet international standards for controlling items on the control lists of the nonproliferation export control regimes, prevent the authorization of transfers to end-uses and end-users of proliferation concern, and detect and interdict illicit transfers at the border. Our EXBS cooperation with China is funded from [appropriations] for the Nonproliferation and Disarmament Fund (NDF). In addition, in coordination with the EXBS program, the Department of Energy conducts Commodity Identification Training aimed at training Chinese frontline Customs enforcement officials and technical ex-

*perts responsible for assessing exports of shipments for nuclear proliferation concerns.*²³⁶

Helping China to Be A Responsible Stakeholder Regarding Proliferation

Ambassador Mahley concluded in his testimony, “We have no realistic option but to continue to work with China to improve transparency, to strengthen enforcement, and to root out increasingly sophisticated proliferation networks and proliferation activities.”²³⁷ The combination of multilateral and bilateral efforts, including the use of U.S. sanctions, is to encourage improved enforcement of China’s international treaty obligations, as well as its own domestic laws and regulations. Deputy Assistant Secretary Sedney noted that this is the stated goal of the Chinese leadership:

*China’s leaders state that they have set their nation on the path of being a ‘responsible stakeholder’ in the international system and that they want a ‘cooperative partnership’ with the United States. These are laudable goals. China’s success or lack thereof in working with the United States and other nations to prevent the proliferation of WMD and missile technology and in preventing Iran and North Korea from behaving in irresponsible and dangerous ways is a key test of how well China’s government is meeting the goals its leaders have set.*²³⁸

Conclusions

- Since the 1990s, China’s nonproliferation record has improved, especially after it established and expanded the reach of its domestic export control system. However, serious concerns remain about the continued transfer of weapons and technology to nations of concern and nonstate actors by Chinese state-controlled and private companies.
- Because of the opacity of China’s government, when incidents of proliferation occur, it generally is difficult or impossible to know whether (1) the government objects to the incidents but is either unaware of them or powerless to stop them; (2) the transactions result from government acquiescence fostered by entrenched corruption; or (3) the government approves of the transactions in direct contravention of its official policy and commitments. Regardless, there is evidence that many illicit transactions are not accidental, and that all three of these explanations may have some validity in various cases.
- It is vital for U.S. national security that China ensure it is not the source of proliferation that is contrary to its commitments, and it is equally vital for other nations committed to nonproliferation to monitor China’s adherence to its commitments and insist that China honor them.
- If China wants to be perceived as a responsible stakeholder, it must stop providing trade and diplomatic cover to countries such as North Korea and Iran that are under international pressure to end their WMD programs.

- Continued United States cooperation with China, and U.S. technical assistance to China, on export controls, border security, customs procedures, and port and shipping security can contribute significantly to China's capacity to play a positive role in reducing proliferation and consequently to increasing the world's security from terrorism and the destructive acts of irresponsible states.
- In order for China to eliminate its proliferating activity, it must couple sufficient technical capacity with strong and unmistakable political commitment, and ensure that its government, its military, and its state-controlled companies and other organizations adhere to both the letter and the spirit of China's multilateral and bilateral nonproliferation commitments.

SECTION 3: CHINA'S SCIENCE AND TECHNOLOGY ACTIVITIES AND ACCOMPLISHMENTS

“The Commission shall investigate and report on—

“ECONOMIC TRANSFERS—The qualitative and quantitative nature of the transfer of United States production activities to the People’s Republic of China, including the relocation of high technology, manufacturing, and research and development facilities, the impact of such transfers on United States national security, the adequacy of United States export control laws, and the effect of such transfers on United States economic security and employment.

“REGIONAL ECONOMIC AND SECURITY IMPACTS—The triangular economic and security relationship among the United States, [Taiwan], and the People’s Republic of China (including the military modernization and force deployments of the People’s Republic of China aimed at [Taiwan]), the national budget of the People’s Republic of China, and the fiscal strength of the People’s Republic of China in relation to internal instability in the People’s Republic of China and the likelihood of the externalization of problems arising from such internal instability.

“UNITED STATES-CHINA BILATERAL PROGRAMS—Science and technology programs, the degree of non-compliance by the People’s Republic of China with agreements between the United States and the People’s Republic of China on prison labor imports and intellectual property rights, and United States enforcement policies with respect to such agreements.”

China’s Fifteen-Year Plan for Science and Technology

In February 2006, the State Council, China’s highest executive body, publicly announced its first long-term plan for the twenty-first century, which intends to bolster China’s science and technology (S&T) progress through 2020.²³⁹ This Fifteen-Year Plan also is China’s first long-term plan since its accession to the World Trade Organization (WTO).²⁴⁰

Premier Wen Jiabao served as chair of the committee representing several government ministries that developed the new S&T plan.²⁴¹ In contrast to the process by which previous S&T plans and programs were developed, preparations for the 2006–2020 plan occurred, at least in the early stages, in a remarkably open environment, with foreign scholars among the 2,000 research-

ers contributing to the policy development process.²⁴² However, the environment later changed as bureaucrats, attempting to strike compromises with each other over controversial portions of the plan, made revisions in secret until the final version was released.²⁴³

Since 1956, technological research and development (R&D) in China has been guided by Five-Year Plans.²⁴⁴ Technology transfers from the Soviet Union in the early years of the People's Republic of China (PRC) aided China in its development of some of its strategic weapons. However, centralized S&T planning—epitomized by the Five-Year Plans—hampered overall technological and scientific development and innovation.²⁴⁵ In addition, the Cultural Revolution (1966–1976) hurt Chinese S&T development, as universities were closed, and professors and students were killed, jailed, or sent to the countryside to work on farms. An entire generation of Chinese researchers and expertise was lost.²⁴⁶

When Deng Xiaoping came to power in 1978, he initiated a number of policies that would advance China's S&T capabilities. Science and technology composed one of Deng's well-known "four modernizations."²⁴⁷ One of Deng's mottos, "science is the first productive force," remains a guiding principle for Chinese development today.²⁴⁸

In the 1980s and 1990s, macro-level research and development efforts such as the "863 Program" and the "973 Program" were initiated.²⁴⁹ Funds allocated to these programs are directed toward various high-tech projects, particularly defense-related research institutes under the China Electronic Technology Group Corporation (CETGC), the PLA General Staff Department, and other defense industrial entities.²⁵⁰ The 863 and 973 Programs, known officially as "High Tech Research and Development Program of China" and "National Basic Research Program of China," respectively, were both designed to aid China's scientific and technological advancement.²⁵¹ Each program takes a slightly different approach. The goals of the 863 program are broad, aiming to obtain technology, sometimes through international sources, to close the gap between China and developed countries. This program covers civilian technologies, but gives emphasis to military and dual-use technologies. The 973 program is specifically designed to provide funding to small and medium-sized companies in China, with the goal of fostering a more technologically advanced indigenous scientific and manufacturing base. Both programs give particular attention to international outreach and cooperation in exchanging expertise.²⁵²

The new Fifteen-Year Plan builds on past plans and policy initiatives, and incorporates them in a single, coherent approach to S&T. It differs from some older initiatives, such as the 863 Program, in that it no longer seeks only to attain parity with western S&T, but instead seeks to surpass the technological prowess of the West.²⁵³ Previously, imports from foreign suppliers were central to China's S&T modernization. This new plan focuses on promoting indigenous innovation and creating an innovation-oriented society. It also promotes "leapfrogging," whereby the development of Chinese technologies improves established foreign technologies, and bypasses intermediate domestic R&D steps. This speeds product development and saves China the time and cost of accomplishing the intermediate steps.²⁵⁴

**S&T Areas and Programs for Development
Identified in China's Fifteen-Year Science Plan ²⁵⁵**

Key Areas

Agriculture	National defense
Energy	Population and health
Environment	Public securities
Information technology industry and modern services	Transportation
Manufacturing	Urbanization and urban development
	Water and mineral resources

Frontier Technology

Advanced energy	Information
Advanced manufacturing	Laser
Aerospace and aeronautics	New materials
Biotechnology	Ocean

Engineering Megaprojects

Advanced numeric-controlled machinery and basic manu- facturing technology	Large-scale oil and gas exploration
Control and treatment of AIDS, hepatitis, and other major diseases	High-definition earth observation systems
Drug innovation and development	Core electronic components, high-end generic chips, and basic software
Extra large scale integrated cir- cuit manufacturing techniques	Genetically modified new- organism variety breeding
Large advanced nuclear reactors	New-generation broadband wireless mobile telecommunications
Manned aerospace and Moon exploration	Large aircraft
	Water pollution control and treatment

Science Megaprojects

Development and reproductive biology	Nanotechnology
Protein science	Quantum research

Experts vary in their assessment of the plan and its potential to transform China's S&T capabilities. Some experts, such as Mr. Cong Cao, researcher at the University of Oregon; Dr. Richard P. Suttmeier, professor of political science at the University of Oregon; and Dr. Denis Simon, provost and vice president for academic affairs at the State University of New York's Levin Institute, writing in *Physics Today*, expressed their assessment that China's Fifteen-Year Plan for S&T will have a major effect on Chinese capabilities in the future. They predict that, if China reaches its R&D spending goals, it will become a global scientific center.²⁵⁶ Some view the plan as a sort of grand experiment, in which the plan's

architects take into account the significance of institutional and cultural reforms. However, experts also believe the plan has flaws, including that it gives little attention to the role of market forces and instead assumes that innovation can be decreed “from above.”²⁵⁷

The extent to which Chinese science and technology may benefit from the policies set forth in the new S&T plan has yet to be determined. It certainly is possible, and is China’s intent, that increases in R&D funding and an emphasis on indigenous innovation will bring Chinese S&T into a new era that is less reliant on foreign technology, and one in which China can contribute more significantly to international S&T efforts. The plan, however, still upholds high-level political control over R&D decisions by ministries such as the Ministry of Science and Technology (MOST). Some scientists in China think these decisions should be in the hands of researchers.²⁵⁸ In addition, accountability and government oversight continue to be problems for Chinese S&T, and frequent allegations of fraud and scientific misconduct continue to plague China’s S&T administrators.²⁵⁹ Nonetheless, the new Fifteen-Year S&T Plan represents a strategy to overcome many of these obstacles and to ensure China’s long-term competitiveness in the rapidly changing world of science and technology.

China’s S&T Progress and Accomplishments

The National Science Foundation recently reported that China’s S&T activities, along with those of other East Asian nations, are gaining strength and capability, and that China is emerging as a regional S&T leader. The report further indicates that the S&T investment and effort of these nations are beginning to produce commercial victories for them in the marketplace, where they are wresting high-technology product market share away from the United States and other nations:

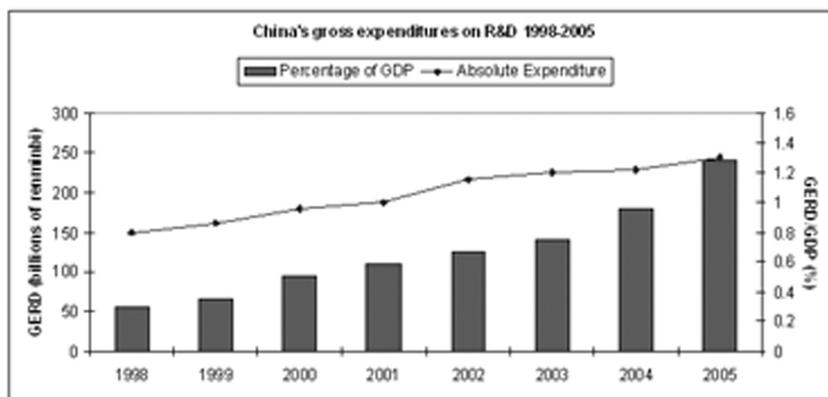
*A range of indicators traces a trend that shows growing competitive strength in the Asian region outside. . . . Japan, chiefly in China, South Korea, Malaysia, Singapore, and Taiwan. Scientists based in those countries produce a growing share of the S&T articles appearing in the world’s leading journals, and development of regional scientific collaboration (centered on China) is apparent. These Asian economies have an expanding world market share of high-technology production. In exports of high-technology products, they are gaining market share on all major industrial nations including the United States.*²⁶⁰

Chinese Expenditures on Research and Development

According to its new S&T plan, China’s R&D expenditures will increase to 2.5 percent of gross domestic product (GDP) by 2025—up from 1.34 percent in 2005.²⁶¹ Yet, even before initiation of this plan, R&D expenditures had been rising.²⁶² In 2006, China’s R&D expenditures surpassed those of Japan for the first time,²⁶³ and now are second only to those of the United States. Even though other top R&D countries have been increasing R&D expenditures,

the rapid pace at which Chinese R&D is growing has caused other countries, including the United States, to see declines in their global shares of R&D spending. (This phenomenon is discussed in more detail in Chapter 1, Section 3, “The Impact of Trade with China on the U.S. Defense Industrial Base.”)

Figure 2.2 China’s Gross Expenditures on R&D 1998–2005



Source: Cong Cao, Richard P. Suttmeier, and Denis Fred Simon, “China 15-year Science and Technology Plan,” *Physics Today*, December 2006, 39, citing National Bureau of Statistics and Ministry of Science and Technology, *China Statistical Yearbook on Science and Technology*, (China Statistics Press, Beijing), various years; national Bureau of Statistics, *China Statistical Abstract 2006*, (China Statistics Press, Beijing), 2006.

Dr. James Mulvenon, Deputy Director of the Center for Intelligence Research and Analysis at Defense Group, Incorporated, testified to the Commission that R&D plays an important role as one of the three vertices of what he described as the “digital triangle.”²⁶⁴ The digital triangle is a paradigm shift in which Chinese military modernization is facilitated by cooperation among the military, commercial civilian information technology (IT) companies, and R&D institutes and funding sources.²⁶⁵ Therefore, it is not surprising that the rise in R&D expenditures in China’s S&T plan corresponds with China’s military modernization goals, particularly indigenous innovation and civil-military integration. As the quality, sophistication, and ambition of China’s R&D activities increase, both the PLA and Chinese IT companies gain access to more advanced technologies.

From 1994 to 2004, the share of business investment in China’s R&D funding increased from 30 percent to 64 percent.²⁶⁶ This change indicates a dramatic shift in thinking about who should bear R&D responsibility and the role that the market can play in developing new technologies. This shift also has been beneficial for the development of military platforms and for China’s “national champions,” as Dr. Mulvenon explains:

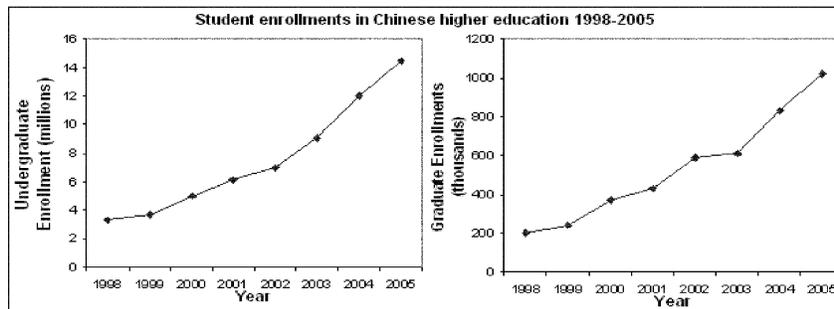
[T]he Chinese IT sector, backed by state R&D funding and national labs, has moved beyond the mere importation of Western technology to co-development with foreign firms and even indigenous development of near state-of-the-art

*technology. The result is significant levels of military access to cutting edge [commercial off-the-shelf] information technology, fueling a [command, control, communications, computers, and intelligence] revolution in the armed forces. Moreover, these IT “national champions” are now aggressively pursuing markets abroad, particularly in the third world regions such as Africa that have been conspicuously avoided by Western firms.*²⁶⁷

Accompanying this shift in funding, China’s state-led research institute sector, which for so long was predominant in China’s S&T pursuits, has been shrinking. In 1991, nearly 6,000 research institutes employed approximately one million employees. By 2004 approximately 4,000 research institutes employed 560,000 employees—representing a loss of nearly half the workforce among such institutes over a 13-year period.²⁶⁸ The shift in approaches appears to have produced significant positive dividends for China. During approximately the same period, Chinese worldwide patent applications increased sharply over the same period, from about 15,000 in 1991 to over 150,000 in 2004. These applications represent a mix of Chinese and non-Chinese companies and individuals filing from China. Between 1995 and 2005, applications submitted from China by Chinese companies and individuals increased 834 percent; and applications submitted from China by non-Chinese companies and individuals increased 819 percent.²⁶⁹

Universities also have been taking responsibility for a larger percentage of R&D in China. While research institutes continue to enjoy greater R&D funding than universities, this gap is closing as both graduate and undergraduate enrollments swell.²⁷⁰

Figure 2.3 Student Enrollment in Chinese Higher Education 1998–2005



Source: Cong Cao, Richard P. Suttmeier, and Denis Fred Simon, "China 15-year Science and Technology Plan," *Physics Today*, December 2006, 40, citing National Bureau of Statistics and Ministry of Science and Technology, *China Statistical Yearbook on Science and Technology*, (China Statistics Press, Beijing), various years; national Bureau of Statistics, *China Statistical Abstract 2006*, (China Statistics Press, Beijing), 2006.

Ensuring the Availability of Qualified Scientists and Engineers

China is now home to about one million scientists and engineers, second in the world only to the United States.²⁷¹ China boasts of world-class R&D in several fields, including life sciences, nano-

science, and space technology. Chinese scientists increasingly are being published in international scientific journals and Chinese cities are chosen more frequently as locations for international science and technology (S&T) conferences and exhibitions.²⁷² As China pursues S&T growth, it must ensure that qualified scientists and engineers will be available both in the near term and also in the more distant future. In the 1990s, China relied on foreign scientists and engineers for technical and consulting advice on weapons development projects. It tapped their expertise via academic exchanges and professional conferences in order to obtain data and information needed by the Chinese defense industry.²⁷³ Even today, China must recruit foreign scientists, in part because many of China's own best scientists and engineers pursue career opportunities abroad. China would prefer to meet its needs for scientists and engineers with its own population.

Among the reasons why China has been forced to import scientific and technological expertise in the past is that, for many years, the quality of the education available from most of China's top universities lagged behind what was available from top universities in leading Western nations, such as the United States and the United Kingdom. Chinese leaders realized that to remain competitive, especially in fields related to science and engineering, China must enable its best students to study in universities of the highest quality. The problem was different for the second tier of Chinese college students, who would not qualify to attend or be able to arrange financing to attend the top Western schools. Chinese post-secondary educational facilities had insufficient capacity to meet the demand, so China arranged for many of these students, as well, to attend other colleges and universities around the world.

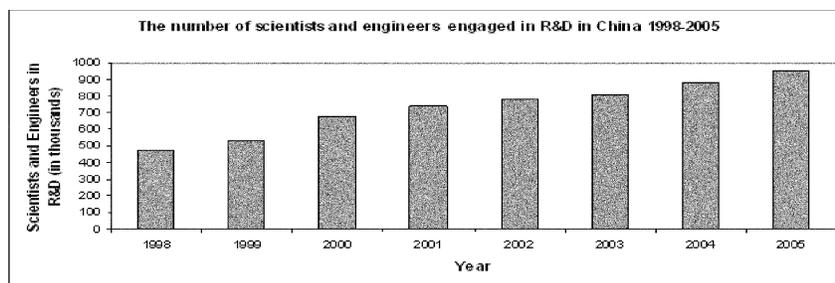
Many students who studied abroad chose not to return to China, and sought and obtained employment in the nations where they had studied. Particularly the brightest and most skilled Chinese students usually found it easy to do this. They were joined abroad by some scientists and engineers who had obtained their advanced degrees in China but found the work and living situations in Western nations more appealing. In China, the absence of an effective patents system and intellectual property rights culture has meant that researchers and their institutions have received little or no reward from the exploitation of their work.²⁷⁴ (See Chapter 1, Section 1 for more details about China's failure to implement an effective mechanism for protecting copyrights, trademarks, and patents.) They knew they would enjoy and benefit from Western nations' strong intellectual property protections and enforcement.

China has had difficulty in attracting Chinese-born scientists and engineers living outside China to return to China to live and work, although it offers an array of incentives to those whose skills and abilities it wants to acquire. These incentives were noted in the National Science Foundation's Science and Engineering Indicators 2004 report:

*[China has] in place, or [is] instituting, policies and incentives to retain their highly trained personnel, attract expatriates, or otherwise benefit from their nationals working abroad, chiefly in the United States.*²⁷⁵

Recently, however, the number of Chinese-born persons educated abroad who return to live and work in China has begun to increase. The Chinese have coined a term for the returnees—“hai gui,” or sea turtles—based on the sea turtle’s practice of traveling far from its place of birth but returning to that place in adulthood to give birth to a new generation. This phenomenon is beginning to stem the Chinese “brain drain.” It is attributable to a number of ways in which working and living conditions in China—at least those pertaining to the educated elites—are improving. These include better housing, improved business opportunities, higher salaries, and more modern workplace equipment and management practices.²⁷⁶ It will be interesting to observe whether the number of “sea turtles” grows further, or whether the disadvantages of returning to live in China (such as earnings lower than those of colleagues who work in many Western nations) prevail.

Figure 2.4 The Number of Scientists and Engineers Engaged in R&D in China, 1998–2005



Source: Cong Cao, Richard P. Suttmeier, and Denis Fred Simon, “China 15-year Science and Technology Plan,” *Physics Today*, December 2006, 39, citing National Bureau of Statistics and Ministry of Science and Technology, *China Statistical Yearbook on Science and Technology*, (China Statistics Press, Beijing), various years; national Bureau of Statistics, *China Statistical Abstract 2006*, (China Statistics Press, Beijing), 2006.

S&T Advancement through Espionage

In order to obtain information, knowledge, and technical data it needs for defense or commercial purposes, China goes well beyond operating formal incentive programs to entice valued scientists and engineers to return or relocate to China and conduct their work there. It also enlists them in organized efforts to obtain valuable data and information from foreign sources, particularly sources within nations in which they reside, by whatever means possible—including theft. In some cases scientists and engineers are urged to obtain proprietary intellectual property (IP) or government secrets held by their employers.

In recent years, several scientists and engineers have been convicted under the Economic Espionage Act after attempting to smuggle proprietary IP to China. In one case involving two Chinese engineers living in the United States, a Chinese company was created in Hangzhou with funding by the local and provincial governments, as well as from the 863 Program. That company was to manufacture and sell microprocessors based on American technology stolen from a U.S. firm and smuggled to China.²⁷⁷ The men

were caught carrying restricted company documents at the airport just before boarding a plane bound for China.

In another case involving a former Chinese national, a software engineer was caught attempting to sell proprietary software used for U.S. military training to China's Naval Research Center.²⁷⁸ Although the United States has increased its pace of prosecuting Chinese industrial espionage cases, the counterintelligence and law enforcement communities find themselves overwhelmed by the volume of these incidents.²⁷⁹ (For a more detailed review of recent Chinese industrial espionage cases, see Chapter 2, Section 1, "China's Military Modernization.")

Chinese Science and Technology Advances and Applications

Optoelectronics

The field of optoelectronics encompasses all electronics technology that relies on an understanding of the physics of light, such as fiber optics, remote sensing, and solar cells. According to a 2006 study by the Bureau of Industry and Security of the U.S. Department of Commerce, commercial uses of optoelectronics, which previously had been used primarily in defense applications, have increased in the last 10 years.²⁸⁰ Although U.S. firms continue to dominate in the defense sector for imaging and sensor technology, Japan, France, Korea, China, and other nations are meeting commercial demand.²⁸¹ According to the study, China achieved 159 percent growth in optoelectronics exports from 2001 to 2005, the world's second highest growth rate during that period.²⁸² Because U.S. export controls on many optoelectronic products preclude U.S. companies from supplying these items to end users in a number of nations, including China, and this market therefore is open to non-U.S. manufacturers, China has had an incentive to maximize the development of its optoelectronics industry. This dynamic is only one reason China is likely to retain a major presence in the optoelectronics industry over the next ten years.

While the United States currently is the leader in optoelectronics, a National Intelligence Council study estimated that a combination of China's centrally planned focus on developing night vision technology, and its ability to exploit export opportunities, will enable China to develop a significant capacity and move into second place in the world in this field by 2014, surpassing all other nations except the United States. Two nations China will surpass, France and Israel, are cooperating with China in its optoelectronics pursuits, enabling it to advance its capability more rapidly than it could if it were dependent solely on its own resources and skills.²⁸³

Information Technology

Chinese military planners see the integration of information technology in existing weapon platforms as key to winning wars under "informatized conditions."²⁸⁴ Possessing first-rate information technology not only expands China's range of offensive and defensive capabilities, but also facilitates joint operations between PLA service branches—a necessary component of twenty-first century warfighting.²⁸⁵

Information technology is central to China's current military modernization campaign and to its overall defense industrial modernization goals.²⁸⁶ For military modernization, integrating current IT systems into older military systems can act as a temporary, stopgap measure until newer systems can be fielded. Other examples of military applications for IT are conducting information operations and electronic or cyber warfare, and constructing and utilizing command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) platforms. In addition, the PLA is using IT to enhance its logistics systems and thereby improve the efficiency and reach of its forces.²⁸⁷

The Chinese defense industry also benefits from the influx of IT investment into China's commercial civilian sector. As Chinese IT companies advance technologically, many of their advances are shared with the defense sector through R&D partnerships, direct transfers, or commercial off-the-shelf products used by Chinese defense companies or the PLA directly.²⁸⁸

In addition to being useful in numerous military applications, IT advancement also contributes to research efforts pertaining to other technologies and fields. Enhanced communications, data processing, and logistics management all help to speed the advancement of other scientific fields of study such as nanoscience and robotics.²⁸⁹ The use of information technology in military applications is discussed in more detail in Chapter 2, Section 1, "China's Military Modernization."

Nanotechnology

The field of nanoscience is one that is loosely defined and variously interpreted, overlapping with other fields of science and technology that deal on very small scales. Dr. Thomas P. Ehrhard of the Center for Strategic and Budgetary Assessment testified to the Commission that "the real technological wild card" appears to be nanotechnology, the manipulation of materials on the molecular scale that yields materials, devices, and systems with novel properties.²⁹⁰ Examples of subfields of nanoscience include microelectronics, biotechnology, and chemistry.²⁹¹ While Chinese S&T capabilities as a whole do not yet qualify as world-class,²⁹² China's nanotechnology capability is an exception, particularly in nanomaterials where Chinese scientists are leaders in the field.²⁹³

Dr. Ehrhard told Commissioners that nanotechnology "should prove to be a critical enabler that will yield a variety of unsettling economic and security challenges, and as a result, many nations are aggressively pursuing research and development in this area. It stands to reason that the [United States] should both pursue its own nanotechnology initiatives and also closely monitor similar developments in China."²⁹⁴

This field has numerous dual-use applications.²⁹⁵ Nanotechnology can be used to create new materials with properties better-suited than natural materials to a specific purpose. For example, the U.S. Air Force uses nanotechnology to develop hard, nanostructured coatings on superalloys.²⁹⁶ Potential Chinese military applications of nanotechnology were noted in testimony before the Commission by Mr. Michael Vickers, then Senior Vice President for

Strategic Studies at the Center for Strategic and Budgetary Assessments:

Should China at some point choose to become a strategic competitor of the United States, it could also find it in its interests to engage in proxy wars to increase its global influence and weaken that of the United States. The emergence of disruptive capabilities, particularly those stemming from advances in nanotechnology, could greatly facilitate new forms of clandestine and covert strategic attack.²⁹⁷

Nanotechnology is one of the four science “megaprojects” identified in the new S&T Fifteen-Year Plan. However, China had been making strides in nanoscience for several years preceding the initiation of that new plan. As one measure of its progress in this field, China now ranks third in the world in nanotechnology patents awarded.²⁹⁸ However, China has only 21 nanotech patents on file with the U.S. Patent and Trademark Office, putting it in twelfth place worldwide by this measure.²⁹⁹

Robotics and Unmanned Vehicle Technology

When comparing the state of advancement of the robotics technology of two nations, the number and sophistication of robots used in manufacturing often is used as a measurement.³⁰⁰ As foreign companies have moved manufacturing to China, they often have imported manufacturing robots to the new factories to maintain manufacturing conformity among their operations worldwide. For example, as Honda has established car manufacturing plants in China, it has brought manufacturing robots to those facilities from Japan.³⁰¹

As more foreign companies have relocated manufacturing to China, they have begun to require local support and services for maintaining their manufacturing robots. This has resulted in Chinese engineers obtaining significant robotics assembly and maintenance expertise from foreign companies to the degree that some Chinese companies are now able to manufacture similar domestic robotic systems, based on technology obtained from foreign companies.³⁰² While Chinese-built manufacturing robots generally have not been of the same quality as the originals, the quality is improving and some Chinese companies are beginning to market their robots to the countries from which the original technology came.³⁰³

Robotics technology has military applications. Although the PLA still imports some of its most advanced unmanned aerial vehicles (UAVs), it has begun to acquire UAVs produced domestically.³⁰⁴ PLA strategists envision UAVs as a powerful countermeasure to American weapon systems and warfighting tactics. Dr. Ehsan Ahrari, professor at the Asia-Pacific Center for Security Studies, noted in his testimony to the Commission:

The PLA is developing its capabilities in the realm of UAV warfare, drones, and related technologies. They are also diligently studying [American] tactics in the Iraqi and Afghan theaters of war, and Israel’s operational and tactical measures against Hezbollah in July–August 2006. Obviously, China has extracted a number of valuable lessons.

That type of knowledge contributes to China's operational and tactical strategy to use anti-ship missiles, cruise missiles, and UAVs.³⁰⁵

Some subcomponents of robotics technology, such as sensor and imagery devices, have stand-alone reconnaissance applications as well. The imagery systems of China's advanced imagery satellites described in Chapter 2, Section 1, "China's Military Modernization," are examples of subcomponents of robotics being used in other technologies.

China has become adept at integrating commercial civilian technologies including optoelectronics, IT, nanotechnology, and robotics into military platforms. This capability has played such a significant role in China's military modernization that Defense Science Board Chairman Dr. William Schneider told the Commission that, as the United States considers ways to ensure its defense industrial base has access to the latest commercial civilian technologies, it needs to give attention to improving and speeding the same kinds of transfers:

The way in which the [Chinese] defense industry has been organized gradually over the past ten or so years is: the major players in the defense industry focus on systems engineering and integration and are increasingly acquiring technology from civil sector high tech companies and creating specific military applications. This process is moving along very rapidly in the information technology sector, and I think we can expect this to be replicated in nanotech and biotech and so forth. So I think there's a process in motion, but it's not fully evolved yet. One of the things that needs to be done is the defense industrial base that the United States depends on needs to be managed in a different way in order to elicit the technology that is now in the civil sector so that it will more routinely and efficiently be able to be transferred to the defense sector.³⁰⁶

Conclusions

- China's Fifteen-Year Plan for science and technology incorporates elements of previous similar plans, but also takes into account important social factors such as needed institutional and cultural reforms. It also places new emphasis on the importance of indigenous innovation rather than reliance on imported high-tech products.
- China no longer seeks only to attain parity with Western S&T, but instead is working to surpass the technological prowess of the West.
- On the whole, Chinese S&T capabilities still are not world-class. In some key specialties such as nanotechnology, however, Chinese scientists and engineers are among the world's most advanced.
- Chinese policies promote "leapfrogging," whereby the development of Chinese technologies improves on established foreign technologies and bypasses intermediate domestic R&D steps.

This speeds product development and saves China the time and cost of accomplishing the intermediate steps. Industrial espionage contributes to this process.

- A major objective of Chinese S&T policy is to acquire technology that will strengthen the PLA while it also realizes commercial benefits.

RECOMMENDATIONS

China's Military Modernization

- In order to slow or stop the outflow of protected U.S. technologies and manufacturing expertise to China, the Commission recommends that Congress assess the adequacy of and, if needed, provide additional funding for U.S. export control enforcement and counterintelligence efforts, specifically those tasked with detecting and preventing illicit technology transfers to China and Chinese state-sponsored industrial espionage operations.
- The Commission recommends that Congress assess the adequacy of and, if needed, provide additional funding for military, intelligence, and homeland security programs that monitor and protect critical American computer networks and sensitive information, specifically those tasked with protecting networks from damage caused by cyber attacks.
- The Commission recommends that Congress ensure that the U.S. Department of Defense and the National Aeronautics and Space Administration have programs to provide access to space, protect space-based assets, and maintain adequate defense measures such as those required for rapid replacement of destroyed assets in space (the Operational Responsive Space framework).
- The Commission recommends that Congress instruct the director of national intelligence to conduct a full assessment of U.S. intelligence capabilities vis-à-vis the military of the People's Republic of China, and identify strategies for addressing any U.S. weaknesses that may be discovered as part of the assessment.
- The Commission recommends that Congress urge the Administration to engage in consultations with its allies on an alliance-based approach to China's cyber attacks.
- The Commission recommends that Congress urge the Administration to engage China in a military dialogue on its actions and programs in cyber and space warfare to include threat reduction mechanisms, the laws of warfare, and specifically how the laws of warfare apply to the cyber and space domains.

China's Proliferation

- The Commission recommends that Congress encourage the Administration to seek to obtain China's agreement to join the Proliferation Security Initiative (PSI).
- The Commission recommends that Congress urge the Administration to provide expanded technical assistance to China in strengthening its export control and border control programs and

capabilities, particularly including enforcement of export controls, in order to prevent proliferation.

China's Science and Technology Activities and Accomplishments

- The Commission recommends that Congress direct the U.S. Department of Commerce to report periodically on the general R&D expenditures of U.S. companies in China, based on protected business proprietary data the Department currently collects.
- The Commission recommends that Congress direct the U.S. Department of Defense to evaluate, and, in its *Annual Report to Congress on the Military Power of the People's Republic of China*, to report on potential Chinese military applications of R&D conducted in China by U.S. companies.

ENDNOTES FOR CHAPTER 2

1. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
2. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
3. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
4. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Bernard D. Cole, March 29, 2007.
5. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Bernard D. Cole, March 29, 2007.
6. Shih Hsiu-chuan, "Legislature finally passes US arms budget," *Taipei Times*, June 16, 2007.
7. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 15.
8. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of James Holmes, June 14, 2007.
9. Some examples from Western literature are: David Shambaugh, *Modernizing China's Military: Progress, Problems, and Prospects*, (University of California Press, Berkeley, CA: 2002) and Crane et al., *Modernizing China's Military: Opportunities and Constraints*, (RAND Corporation, Santa Monica, CA: 2005). China's National Defense White Papers in 2000, 2002, 2004, and 2006 also describe long-term modernization goals to this effect.
10. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 25.
11. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 25.
12. "Roundup: China's defense budget to rise 17.8 percent in 2007," *People's Daily.com*, March 5, 2007. english.people.com.cn/200703/05/eng20070305_354267.htm.
13. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 25.
14. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of William Schneider, Jr., March 29, 2007.
15. U.S.-China Economic and Security Review Commission, *Hearing on U.S. China Relationship: Economics and Security in Perspective*, testimony of Congressman J. Randy Forbes, February 1, 2007.
16. U.S. Department of Defense, *Quadrennial Defense Review Report*, (Washington, DC: February 2006), p. 3.
17. U.S. House of Representatives Armed Services Committee, *Hearing on China: Recent Security Developments*, testimony of Deputy Under Secretary of Defense for Asian and Pacific Security Affairs Richard P. Lawless, June 13, 2007.
18. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
19. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
20. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
21. U.S. House of Representatives Armed Services Committee, *Hearing on China: Recent Security Developments*, testimony of Deputy Under Secretary of Defense for Asian and Pacific Security Affairs Richard P. Lawless, June 13, 2007.
22. *Jane's Information Group, Jane's Fighting Ships 2006-2007: China, People's Liberation Army Navy (PLAN)*, (London: 2007), p. 124, 127.
23. *Jane's Information Group, Jane's Fighting Ships 2006-2007: China, People's Liberation Army Navy (PLAN)*, (London: 2007), p. 124.

24. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
25. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Eric A. McVadon, March 29, 2007.
26. Tan Shoulin and Zhang Daqiao, "Effective Range for Terminal Guidance Ballistic Missile Attacking Aircraft Carrier," *Qingbao Zhihui Kongzhi yu Fangzhen Jishu (Information Command and Control Systems and Simulation Technology)*, Vol. 28, No 4, August 2006, 6–9.
27. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Andrew Erickson, March 29, 2007.
28. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
29. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
30. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Andrew Erickson, March 29, 2007.
31. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Andrew Erickson, March 29, 2007.
32. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Andrew Erickson, March 29, 2007.
33. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
34. Admiral Mike Mullen, "Commentary: We Can't Do It Alone," *Honolulu Advisor*, October 29, 2006. www.navy.mil/navydata/cno/mullen/Honolulu_Advertiser_October_29_2006.pdf. The "thousand-ship navy" concept is sometimes referred to as the "global maritime partnership initiative."
35. P. Parameswaran, "US Asks China To Help Maintain Global Maritime Security," *Agence France-Presse*, April 10, 2007. www.terraviva.com/reports/US_Ask_China_To_HelpMaintain_Global_Maritime_Security_999.html.
36. Eric A. McVadon, "U.S.-PRC Maritime Cooperation: An Idea Whose Time Has Come?" *China Brief*, Volume 7, Issue 12, June 13, 2007. www.jamestown.org/china_brief/article.php?articleid=2373469.
37. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Eric A. McVadon, March 29, 2007.
38. National Defense Authorization Act for Fiscal Year 2000, section 1203, "Military-to-Military Contacts with Chinese People's Liberation Army."
39. "PRC Success in Making Jian-10 Fighter Plane Signifies 'Historic Leap'," *Xinhua Domestic Service*, January 5, 2007. www.opensource.gov.
40. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
41. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
42. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
43. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 17.
44. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 3.
45. "Theatre Missile Systems," Federation of American Scientists. www.fas.org/nuke/guide/china/theater/index.html.
46. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Eric A. McVadon, March 29, 2007.
47. Andrei Chang, "PLA Contemplates Aircraft Carrier Strikes," *Kanwa Defense Review in English*, July 30, 2007.

48. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Eric A. McVadon, March 29, 2007.
49. Gao Yubiao, ed., *Lianhe Zhanyi Xue Jiaocheng (Textbook of the Science of Joint Campaigns)*, (Junshi Kexue Chubanshe, Beijing: 2001), pp. 26, 27, 70–71.
50. Cai Fengzhen et al., *Kongtian Yiti Zuozhan Xue (Integrated Aerospace Operations)*, (Jiefangjun Chubanshe, Beijing: 2006).
51. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of James Mulvenon, July 13, 2007.
52. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of James Mulvenon, July 13, 2007.
53. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
54. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
55. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.
56. U.S. Department of Defense, *Quadrennial Defense Review Report*, (Washington, DC: February 2006), p. 29.
57. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 15.
58. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Ehsan Ahrari, March 29, 2007.
59. U.S. Department of Defense, *Quadrennial Defense Review Report*, (Washington, DC: February 2006), p. 29.
60. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of James A. Lewis, March 30, 2007.
61. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Ehsan Ahrari, March 30, 2007.
62. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of James E. Cartwright, March 29, 2007.
63. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of James E. Cartwright, March 29, 2007.
64. Mark Lander and John Markoff, "War Fears Turn Digital After Data Siege in Estonia," *New York Times*, May 29, 2007. Denial of service attacks were employed on a large scale against Estonia in April and May 2007, allegedly by hackers from Russia. The month-long series of attacks in Estonia demonstrated the damage that can be caused by conducting continuous denial of service attacks against an opponent. Estonian defense minister Jaak Aaviksoo, in referring to the attacks that nearly shut down the country's digital infrastructure and its largest bank, compared the effect of the attacks to that of blocking Estonia's ports.
65. Robert Marquand and Ben Arnoldy, "China's hacking skills in spotlight," *The Seattle Times*, September 16, 2007.
66. Regret factors include the damage that could be caused as a result of the widespread chaos, havoc, and mass hysteria that a large-scale cyber attack could bring to bear on a country that is as reliant on integrated computer networks as the United States.
67. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of James E. Cartwright, March 29, 2007.
68. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Eric D. Hagt, March 30, 2007.
69. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Eric D. Hagt and Mary C. FitzGerald, March 30, 2007.
70. Phillip C. Saunders and Charles D. Lutes, "China's ASAT Test: Motivations and implications," *National Defense University INSS Report*, June 2007, 4; Caitlin

Harrington, "Chinese ASAT prompts US strategic rethink," *Janes' Defence Weekly*, Vol. 44, Issue 18, May 2007, 8.

71. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of Richard P. Lawless, February 1, 2007.

72. U.S.-China Economic and Security Review Commission April 2007 trip, statement made by Xie Feng, Ministry of Foreign Affairs Director General for North American Affairs.

73. U.S. House of Representatives Armed Services Committee, *Hearing on China: Recent Security Developments*, testimony of Deputy Under Secretary of Defense for Asian and Pacific Security Affairs Richard P. Lawless, June 13, 2007.

74. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 19.

75. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 19.

76. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), pp. 19-20.

77. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Cortez Cooper, March 29, 2007.

78. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 20.

79. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 25.

80. Crane et al., *Modernizing China's Military: Opportunities and Constraints*, (RAND Corporation, Santa Monica, CA: 2005), pp. xx-xxi, pp. 154-157.

81. Examples of this concept in Chinese literature noted in Crane et al., *Modernizing China's Military: Opportunities and Constraints*, (RAND Corporation, Santa Monica, CA: 2005), pp.154,155: Xiao Yusheng, Chen Yu, "Historic Leaps in China's Military Scientific Study," *Renmin Ribao*, 25 February 1999, p. 9, in FBIS as "Military Scientific Studies Take Leap," 2 March 1999; An Weiping, "Thoughts on Developing Armaments by Leaps and Bounds," *Xinhua Domestic Service*, 1 July 1999, in FBIS as "Jiang Congratulates Defense Enterprise Restructuring," 2 July 1999; Gong Fangling, "There Should Be New Ideas in Defense Economic Building," *Jiefangjun Bao*, 14 September 1999, p. 6, in FBIS as "Article on 'Defense Economic Building,'" 23 September 1999; Li Xuanqing, Fan Juwei, Fu Mingyi, "All-Army Weaponry Work Conference Convened in Beijing," *Jiefangjun Bao*, 4 November 1999, p. 1, in FBIS as "Army Weaponry Work Conference Opens," 10 November 1999; Wang Congbiao, "Implement the Strategy of Strengthening the Military Through Science and Technology to Improve the Defensive Combat Capabilities of China's Military-Studying Jiang Zemin's 'On Science and Technology,'" *Jiefangjun Bao (internet version)*, 13 February 2001, p. 1, in FBIS as "Review of Jiang Zemin's Views on High-Tech Military," 13 February 2001.

82. Examples of this concept in Chinese literature noted in Crane et al., *Modernizing China's Military: Opportunities and Constraints*, (RAND Corporation, Santa Monica, CA: 2005), p.156: Liu Jibin, "Implement the Guideline of Military-Civilian Integration, Rejuvenate the National Defense Science and Technology Industry," op. cit.; Liu Zhenying, Sun Jie, *Xin-hua Domestic Service*, 1 July 1999, in FBIS as "More on Zhu at Defense Group Ceremony," 1 July 1999; Central Television Program One Network, 1 July 1999, in FBIS as "Zhu at Defense Ceremony," 1 July 1999; Peng Kai-lei, "Five Major Military Industry Corporations Formally Reorganized," *Xinhua*, 1 July 1999, in FBIS as "Zhu Rongji Urges Sci-Tech Work for National Defense," 1 July 1999; Ye Weiping, "Challenges and Opportunities for Ordnance Industry Following China's Entry to WTO (Part 2 of 2)," *Ta Kung Pao (internet version)*, 26 April 2000, in FBIS as "Part 2: Ta Kung Pao on WTO Impact on Ordnance Industries," 3 May 2000; Wang Congbiao, "Implement the Strategy of Strengthening the Military Through Science and Technology to Improve the Defensive Combat Capabilities of China's Military-Studying Jiang Zemin's 'On Science and Technology,'" op. cit.

83. Examples of this concept in Chinese literature noted in Crane et al., *Modernizing China's Military: Opportunities and Constraints*, (RAND Corporation, Santa Monica, CA: 2005), p.156: Maj. Gen Xun Zhenjiang, Captain Geng Haijun, "Exploring the Chinese Way to Develop Military Weaponry," op. cit. See also General Li Xinliang, "Hi-Tech Local Wars' Basic Requirements for Army Building," *Zhongguo Junshi Kexue*, 20 November 1998, pp. 15-20, in FBIS as "Li Xinliang on High-Tech Local War," 17 May 1999.

84. Crane et al., *Modernizing China's Military: Opportunities and Constraints*, (RAND Corporation, Santa Monica, CA: 2005), p. 154.

85. Gabriel B. Collins and Andrew S. Erickson, "Tanking Up: The Commercial and Strategic Significance of China's Growing Tanker Fleet," *Geopolitics of Energy*, Vol. 29, No. 8, August 2007, 2; U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 3; U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Andrew Erickson, March 29, 2007.
86. U.S. House of Representatives Armed Services Committee, *Hearing on China: Recent Security Developments*, testimony of Deputy Under Secretary of Defense for Asian and Pacific Security Affairs Richard P. Lawless, June 13, 2007.
87. Jane's Information Group, *Jane's Fighting Ships 2006-2007: China, People's Liberation Army Navy (PLAN)*, (London: 2007), p. 120.
88. Jane's Information Group, *Jane's Fighting Ships 2006-2007: China, People's Liberation Army Navy (PLAN)*, (London: 2007), p. 121.
89. U.S. House of Representatives Armed Services Committee, *Hearing on China: Recent Security Developments*, testimony of Deputy Under Secretary of Defense for Asian and Pacific Security Affairs Richard P. Lawless, June 13, 2007.
90. Crane et al., *Modernizing China's Military: Opportunities and Constraints*, (RAND Corporation, Santa Monica, CA: 2005), p. 155.
91. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Eric D. Hagt, March 30, 2007.
92. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 20.
93. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 20.
94. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 20.
95. William S. Rees, *Briefing on American and Chinese Science and Technology Developments*, briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio: June 29, 2007.
96. William S. Rees, *Briefing on American and Chinese Science and Technology Developments*, briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio: June 29, 2007.
97. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of James Mulvenon, July 13, 2007.
98. Fabless integrated circuit production is performed by companies that do not have fabrication facilities to produce their own silicon wafers. Instead, fabless companies focus on the design of the chips and have them manufactured elsewhere.
99. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of James Mulvenon, July 13, 2007.
100. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Tai Ming Cheung, July 13, 2007.
101. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Tai Ming Cheung, July 13, 2007.
102. Medeiros et al., *A New Direction for China's Defense Industry*, (RAND Corporation, Santa Monica, CA: 2005) pp. 25-26.
103. Medeiros et al., *A New Direction for China's Defense Industry*, (RAND Corporation, Santa Monica, CA: 2005) p. 7.
104. U.S.-China Economic and Security Review Commission, *Hearing on The Extent of the Government's Control of China's Economy, and Implications for the United States*, testimony of Barry Naughton, May 24, 2007.
105. Medeiros et al., *A New Direction for China's Defense Industry*, (RAND Corporation, Santa Monica, CA: 2005) p. 43.
106. Medeiros et al., *A New Direction for China's Defense Industry*, (RAND Corporation, Santa Monica, CA: 2005) p. 43.
107. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of James Mulvenon, July 13, 2007. Mulvenon sees this as a "scathing indictment of the failures of the PRC defense-industrial base to fulfill its long-standing promises to the PLA."
108. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 29.

109. Medeiros et al., *A New Direction for China's Defense Industry*, (RAND Corporation, Santa Monica, CA: 2005) p. 241.
110. Medeiros et al., *A New Direction for China's Defense Industry*, (RAND Corporation, Santa Monica, CA: 2005) p. 241.
111. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of William Schneider, Jr., March 29, 2007.
112. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 29.
113. U.S. Department of Justice Press Release, "Two Men Plead Guilty to Stealing Trade Secrets from Silicon Valley Companies to Benefit China: First Conviction in the Country for Foreign Economic Espionage," December 14, 2006.
114. U.S. Department of Justice Press Release, "Two Men Plead Guilty to Stealing Trade Secrets from Silicon Valley Companies to Benefit China: First Conviction in the Country for Foreign Economic Espionage," December 14, 2006.
115. Jeff Bliss, "China's Spying Overwhelms U.S. Counterintelligence," *Bloomberg*, April 2, 2007.
116. Amy Argetsinger, "Spy Case Dismissed for Misconduct," *Washington Post*, January 7, 2005; Bill Gertz, "FBI calls Chinese espionage 'substantial,' *The Washington Times*, July 27, 2007.
117. U.S. Department of Justice Press Release, "Guilty Plea in Trade Secrets Case," February 15, 2007.
118. Jeff Bliss, "China's Spying Overwhelms U.S. Counterintelligence," *Bloomberg*, April 2, 2007.
119. Center for Counterintelligence and Security Studies, "Chi Mak, Tai Wang Mak Espionage/Spy Case." http://cicentre.com/Documents/DOC_Chi_Mak.html.
120. Bill Gertz, "China Espionage," *The Washington Times*, August 10, 2007.
121. U.S. Department of Justice Press Release, "Former Chinese National Convicted of Economic Espionage to Benefit China Navy Research Center," August 2, 2007.
122. According to an interview with former Central Intelligence Agency official, Keith Riggan in: Jeff Bliss, "China's Spying Overwhelms U.S. Counterintelligence," *Bloomberg*, April 2, 2007.
123. Bill Gertz, "FBI calls Chinese espionage 'substantial,' *The Washington Times*, July 27, 2007.
124. Jeff Bliss, "China's Spying Overwhelms U.S. Counterintelligence," *Bloomberg*, April 2, 2007.
125. Bill Gertz, "FBI calls Chinese espionage 'substantial,' *The Washington Times*, July 27, 2007.
126. U.S. Department of Justice Press Release, "Former Chinese National Convicted of Economic Espionage to Benefit China Navy Research Center," August 2, 2007; U.S. Department of Justice Press Release, "Two Men Plead Guilty to Stealing Trade Secrets from Silicon Valley Companies to Benefit China: First Conviction in the Country for Foreign Economic Espionage," December 14, 2006; Jeff Bliss, "China's Spying Overwhelms U.S. Counterintelligence," *Bloomberg*, April 2, 2007; Amy Argetsinger, "Spy Case Dismissed for Misconduct," *Washington Post*, January 7, 2005; Bill Gertz, "FBI calls Chinese espionage 'substantial,' *The Washington Times*, July 27, 2007; U.S. Department of Justice Press Release, "Guilty Plea in Trade Secrets Case," February 15, 2007; U.S. Department of Justice Press Release, "Fifth Family Member Pleads Guilty in Scheme to Export U.S. Defense Articles to China," June 6, 2007.
127. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.
128. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
129. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
130. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact*

of *Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

131. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Xiao Qiang, July 31, 2007.

132. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

133. Information Office of the State Council of the People's Republic of China, "X: International Security Cooperation," *China's National Defense in 2006*. [english.people.com.cn/whitepaper/defense2006/defense2006\(10\).html](http://english.people.com.cn/whitepaper/defense2006/defense2006(10).html).

134. "Transcript of PRC FM Spokesman News Conference on 6 Sep 07," *Ministry of Foreign Affairs of the People's Republic of China*, September 6, 2007. OSC ID: CPP20070906038001. www.opensource.gov.

135. Article 1, Comprehensive Test Ban Treaty, www.ctbto.org/treaty/treaty_text.tt.html.

136. Shirley A. Kan, *China and Proliferation of Weapons of Mass Destruction and Missiles: Policy Issues, Updated*, (Congressional Research Service, Washington, DC: April 2006), p. 1.

137. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

138. The Australia Group, "AG Objectives," www.australiagroup.net/en/agobj.htm.

139. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

140. "Hague Code of Conduct Against Ballistic Missile Proliferation (HCOC)." cns.miis.edu/pubs/inven/pdfs/icoc.pdf.

141. U.S. Department of Commerce, Bureau of Industry and Security, "The Waasenaar Arrangement." www.bis.doc.gov/wassenaar/default.htm.

142. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

143. Phillip P. Pan, "China Issues Rules on Missile Exports," *Washington Post*, August 26, 2002.

144. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Jing-dong Yuan, July 12, 2007.

145. Dr. James Mulvenon, in an email to Commission staff, October 24, 2007.

146. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Jing-dong Yuan, July 12, 2007.

147. Director of Central Intelligence, Central Intelligence Agency, *Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions*, 1 January–31 December 2004, (Washington, DC: May 2006), p. 7.

148. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Jing-dong Yuan, July 12, 2007.

149. "China Tightens Dual-Use Nuclear Export Controls," *Xinhua*, February 16, 2007.

150. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Jing-dong Yuan, July 12, 2007.

151. Center for International Trade and Security, *Export Controls in the People's Republic of China: 2005*, (University of Georgia, Athens, GA: February 2005), p. 1.

152. Director of Central Intelligence, Central Intelligence Agency, *Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions*, 1 January–31 December 2004, (Washington, DC: May 2006), p. 7.

153. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

154. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

155. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Gary Bertsch, July 12, 2007.

156. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Brad Roberts, July 12, 2007.

157. Center for International Trade and Security, *Export Controls in the People's Republic of China: 2005*, (University of Georgia, Athens, GA: February 2005), pp. 1–2, 37.

158. According to the Department of Energy, yellowcake is a natural concentrated ore that contains uranium. In the nuclear fuel cycle, yellowcake is sent to a conversion plant where it is transformed into uranium hexafluoride, which is suitable for enrichment.

159. Stephanie Lieggi, "Uranium Smuggling Case in China Raises Concern," *WMD Insights*, October 2007. cns.miis.edu/pubs/other/wmdi071008c.htm.

160. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Brad Roberts, July 12, 2007.

161. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Brad Roberts, July 12, 2007.

162. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Brad Roberts, July 12, 2007.

163. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

164. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

165. Shirley A. Kan, *China and Proliferation of Weapons of Mass Destruction and Missiles: Policy Issues, Updated* (Congressional Research Service, Washington DC: May 9, 2007), p. 11–13.

166. Shirley A. Kan, *China and Proliferation of Weapons of Mass Destruction and Missiles: Policy Issues, Updated* (Congressional Research Service, Washington DC: May 2007), pp. 11–13.

167. Mr. Henry Sokolski, Executive Director of the Nonproliferation Policy Education Center, in personal conversation with Commission staff, October 24, 2007.

168. See also U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

169. Chaim Braun, "Security Issues Related to Future Pakistani Nuclear Power Program," September 14, 2006. www.npec-web.org/frameset.asp?PageType=Single&PDFFile=20060605-Braun-SecurityIssuesPakistan&PDFFolder=Essays.

170. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

171. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

172. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

173. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Joseph Cirincione, July 12, 2007.

174. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

175. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.
176. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.
177. United Nations Security Council, Resolution 1695 (2006).
178. Warren Hoge, "U.N. resolution on missiles OK'd in weaker form," *San Diego Union-Tribune*, July 16, 2006.
179. United Nations Security Council, Resolution 1718 (2006).
180. For example, see David Lague and Warren Hoge, "Deal Nears on Sanctions for North Korea," *The New York Times*, October 13, 2006.
181. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
182. U.S. Department of State, "Six Party Talks: Briefing on the Agreement Reached At the Six Party Talks in Beijing," February 13, 2007. korea.usembassy.gov/420_021407b.html.
183. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.
184. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
185. U.S. Department of Treasury, "Statement by DAS Glaser on the Disposition of DPRK-Related Funds Frozen at Banco Delta Asia," March 19, 2007.
186. Choe Sang-Hun, "North Korea Ready to Implement Nuclear Deal," *New York Times*, June 25, 2007.
187. "China sends oil to the North but says no date set for the next round of nuclear talks," *International Herald Tribune*, September 18, 2007.
188. United Nations Security Council, Resolution 1737 (2006).
189. United Nations Security Council, Resolution 1737 (2006).
190. United Nations Security Council, Resolution 1747 (2007).
191. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
192. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
193. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
194. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
195. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
196. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.
197. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
198. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
199. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.
200. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

201. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

202. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

203. United Nations Security Council, Resolution 1779 (2007), in addition to Resolutions 1591 (2005) and 1556 (2004).

204. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Jing-dong Yuan, July 12, 2007.

205. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

206. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

207. Antoaneta Bezlova, "China joins U.N. peacekeepers in Sudan," *Asia Times*, September 25, 2007.

208. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

209. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Brad Roberts, July 12, 2007.

210. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Jing-dong Yuan, July 12, 2007.

211. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Gary Bertsch, July 12, 2007.

212. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

213. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Gary Bertsch, July 12, 2007.

214. Ambassador Mahley also noted in his testimony that NORINCO has reportedly adopted an internal compliance program.

215. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

216. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Jing-dong Yuan, July 12, 2007.

217. North Korea Nonproliferation Act, Pub. L. 109-353 (2006).

218. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

219. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

220. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

221. See Appendix VII-B for a listing of sanctions imposed on Chinese entities since the Commission's 2004 report.

222. Also sanctioned in December 2005.

223. Also sanctioned in June 2006.

224. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Brad Roberts, July 12, 2007.

225. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Jing-dong Yuan, July 12, 2007.

226. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

227. Shirley A. Kan, *China and Proliferation of Weapons of Mass Destruction and Missiles: Policy Issues, Updated* (Congressional Research Service, Washington DC: May 2007), p. 40.

228. Shirley A. Kan, *China and Proliferation of Weapons of Mass Destruction and Missiles: Policy Issues, Updated* (Congressional Research Service, Washington DC: May 2007), p. 40. In 2004, then-Under Secretary of State for Arms Control and International Security John Bolton acknowledged that the United States has received cooperation with China on interdiction operations, although not through the PSI.

229. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

230. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

231. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

232. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

233. WMD refers to biological, chemical, and nuclear weapons. According to the Department of Homeland Security, WME (weapons of mass effect) are weapons capable of inflicting grave destructive, psychological, and/or economic damage to the United States. These include chemical, biological, nuclear, radiological, or explosive weapons." www.dhs.gov/xlibrary/assets/hsac_wme-report_20050110.pdf.

234. U.S. Customs and Border Protection, "CSI in Brief." www.cbp.gov/xp/cgov/border_security/international_activities/csi/csi_in_brief.xml.

235. U.S. Department of Commerce, Bureau of Industry and Security, Annual Report—FY 1998, (Washington, DC), p. 104. [www.bis.doc.gov/News/Publications/chap7oee.pdf](http://www.bis.doc.gov/News/Publications/chap7oe.pdf).

236. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

237. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of Donald Mahley, July 12, 2007.

238. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China*, testimony of David Sedney, July 12, 2007.

239. Sylvia Schwaag Serger and Magnus Breidne, "China's Fifteen-Year Plan for Science and Technology: An Assessment," *Asia Policy*, Number 4, July 2007, 137; Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 38.

240. Sylvia Schwaag Serger and Magnus Breidne, "China's Fifteen-Year Plan for Science and Technology: An Assessment," *Asia Policy*, Number 4, July 2007, 137.

241. Sylvia Schwaag Serger and Magnus Breidne, "China's Fifteen-Year Plan for Science and Technology: An Assessment," *Asia Policy*, Number 4, July 2007, 149.

242. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 38; Sylvia Schwaag Serger and Magnus Breidne, "China's Fifteen-Year Plan for Science and Technology: An Assessment," *Asia Policy*, Number 4, July 2007, 150.

243. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 38.

244. The Embassy of the People's Republic of China to New Zealand, "Overview of China's S&T Management System," August 13, 2007. www.chinaembassy.org.nz/eng/kj/t39433.htm.

245. Sylvia Schwaag Serger and Magnus Breidne, "China's Fifteen-Year Plan for Science and Technology: An Assessment," *Asia Policy*, Number 4, July 2007, 138.

246. Sylvia Schwaag Serger and Magnus Breidne, "China's Fifteen-Year Plan for Science and Technology: An Assessment," *Asia Policy*, Number 4, July 2007, 138.

247. Deng's "four modernizations" were: agriculture, industry, science and technology, and national defense.

248. Sylvia Schwaag Serger and Magnus Breidne, "China's Fifteen-Year Plan for Science and Technology: An Assessment," *Asia Policy*, Number 4, July 2007, 138.

249. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of Michael Danis, July 13, 2007. These programs are named for the year and month in which they were initiated. Thus, the 863 Program was initiated in March 1986 and the 973 Program was initiated in March 1997.
250. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of James Mulvenon, July 13, 2007.
251. High Tech Research and Development Program of China web site. www.863.org.cn/english/index.html; National Basic Research Program of China web site. www.973.gov.cn/English/Index.aspx.
252. *Guide to China's Science and Technology Policy: White Paper on Science and Technology No.6*, (Beijing: August 1995), OSC ID: FTS19950801000840. www.opensource.gov.
253. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of Michael Danis, July 13, 2007.
254. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of Michael Danis, July 13, 2007.
255. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 43.
256. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 42.
257. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 42; Sylvia Schwaag Serger and Magnus Breidne, "China's Fifteen-Year Plan for Science and Technology: An Assessment," *Asia Policy*, Number 4; July 2007, 161.
258. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 42.
259. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 42.
260. National Science Foundation, *Science and Engineering Indicators 2004*, (Arlington, VA: January 2004), p. 0-19.
261. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 38.
262. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 39.
263. R&D Magazine, *Global R&D Report 2008*, (Northbrook, IL: September 2007), p. G3.
264. Explained further in Chapter 2, Section 1, "China's Military Modernization."
265. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of James Mulvenon, July 13, 2007.
266. National Bureau of Statistics and Ministry of Science and Technology, *China Statistical Yearbook on Science and Technology 2005* (China Statistics Press, Beijing: 2005).
267. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of James Mulvenon, July 13, 2007.
268. National Bureau of Statistics and Ministry of Science and Technology, *China Statistical Yearbook on Science and Technology 2005* (China Statistics Press, Beijing: 2005).
269. World Intellectual Property Organization, *WIPO Patent Report: Statistics on Worldwide Patent Activity (2007 Edition)*. www.wipo.int/ipstats/en/statistics/patents/patent_report_2007.html#P173_14118.
270. National Bureau of Statistics and Ministry of Science and Technology, *China Statistical Yearbook on Science and Technology 2005* (China Statistics Press, Beijing), various years; National Bureau of Statistics, *China Statistical Abstract 2006* (China Statistics Press, Beijing: 2006).
271. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 42.
272. Cao et al., "China's 15-year science and technology plan," *Physics Today*, December 2006, 43; Asian Technology and Information Program, *Survey of Chinese S&T Status*, (Tokyo, Japan: June 2007), p. 1.
273. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of Tai Ming Cheung, July 13, 2007.

274. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of Tai Ming Cheung, July 13, 2007.

275. National Science Foundation, *Science and Engineering Indicators 2004*, (Arlington, VA: January 2004), p. O-19.

276. David Zweig, "Competing for talent: China's strategies to reverse the brain drain," *International Labour Review*, special issue: migration, vol. 145/1-2, International Labour Office, Geneva, 2006.

277. U.S. Department of Justice Press Release, "Two Men Plead Guilty to Stealing Trade Secrets from Silicon Valley Companies to Benefit China: First Conviction in the Country for Foreign Economic Espionage," December 14, 2006.

278. Bill Gertz, "China Espionage," *The Washington Times*, August 10, 2007.

279. Jeff Bliss, "China's Spying Overwhelms U.S. Counterintelligence," *Bloomberg*, April 2, 2007.

280. U.S. Department of Commerce, Bureau of Industry and Security, *Defense Industrial Base Assessment: U.S. Imaging and Sensors Industry*, (Washington, DC: October 2006), p. IX-2.

281. U.S. Department of Commerce, Bureau of Industry and Security, *Defense Industrial Base Assessment: U.S. Imaging and Sensors Industry*, (Washington, DC: October 2006), p. I-1.

282. U.S. Department of Commerce, Bureau of Industry and Security, *Defense Industrial Base Assessment: U.S. Imaging and Sensors Industry*, (Washington, DC: October 2006), p. VII-12.

283. National Intelligence Council, Science and Technical Intelligence Committee, *Global Technological Assessment of High Performance Mercury Cadmium Telluride Infra-Red Focal Plane Arrays*, September 2004, p. 20.

284. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 5; U.S. House of Representatives Armed Services Committee, *Hearing on China: Recent Security Developments*, testimony of Deputy Under Secretary of Defense for Asian and Pacific Security Affairs Richard P. Lawless, June 13, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Mark Cozad, March 29, 2007.

285. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Mark Cozad, March 29, 2007.

286. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of William Schneider, Jr., March 29, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of James Mulvenon, July 13, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of Tai Ming Cheung, July 13, 2007.

287. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Mark Cozad, March 29, 2007.

288. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of James Mulvenon, July 13, 2007.

289. Asian Technology and Information Program, *Survey of Chinese S&T Status*, (Tokyo, Japan: June 2007), pp. 11, 19.

290. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of Thomas P. Ehrhard, February 2, 2007.

291. Asian Technology and Information Program, *Survey of Chinese S&T Status*, (Tokyo, Japan: June 2007), p. 11.

292. John Parmentola, *Briefing on American and Chinese Science and Technology Developments*, briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 29, 2007.

293. Christine M. Anderson, *Briefing on American and Chinese Science and Technology Developments*, briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 29, 2007.

294. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of Thomas P. Ehrhard, February 2, 2007.

295. U.S.-China Economic and Security Review Commission, *Hearing on China's Proliferation and the Impact of Trade Policy on the Defense Industries in the United States and China*, testimony of Tai Ming Cheung, July 13, 2007.

296. Brendan B. Godfrey, *Strategy and Investments*, (Department of the Air Force briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007) p. 28.

297. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Michael Vickers, March 29, 2007.

298. John Parmentola, *Army Science and Technology Investment Priorities*, Department of the Army briefing to the U.S.-China Economic and Security Review Commission, Wright-Patterson Air Force Base, Ohio, June 28, 2007, p. 18.

299. Josh Wolfe, "Nanotech Gets Big in China," *Forbes/Wolfe Nanotech Report*, February 1, 2007. www.forbes.com/2007/02/01/nanotech-china-veeco-pf-guru-in_jw_0201soapbox_inl.html.

300. Asian Technology and Information Program, *Survey of Chinese S&T Status*, (Tokyo, Japan: June 2007), p. 14.

301. Asian Technology and Information Program, *Survey of Chinese S&T Status*, (Tokyo, Japan: June 2007), p. 14.

302. Asian Technology and Information Program, *Survey of Chinese S&T Status*, (Tokyo, Japan: June 2007), p. 15.

303. Asian Technology and Information Program, *Survey of Chinese S&T Status*, (Tokyo, Japan: June 2007), p. 15.

304. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 18. For example, the PLA uses the Israeli HARPY drone.

305. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Ehsan Ahrari, March 29, 2007.

306. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of William Schneider, Jr., March 29, 2007.

CHAPTER 3
CHINA'S ENERGY AND ENVIRONMENTAL
POLICIES AND ACTIVITIES
SECTION 1: CHINA'S ENERGY POLICY,
DEMAND, AND SUPPLY

“The Commission shall investigate and report on—

“ENERGY—The effect of the large and growing economy of the People’s Republic of China on world energy supplies and the role the United States can play (including joint research and development efforts and technological assistance), in influencing the energy policy of the People’s Republic of China.”

Energy Policymaking in China

China’s rapid economic development and its rising energy demand are interrelated; energy fuels the country’s production, and domestic consumption drives its need for energy. Given energy’s intrinsic link to economic development, the Chinese government has highlighted this issue as a priority of government policy, and until recently has kept the majority of the energy market under government control. While the success of China’s economic reforms occurred as a result of the decentralization of government control over the market, the decentralization of energy policymaking to local officials has not produced a comparably positive outcome. Instead, it has resulted in a fragmented energy policy that lacks both the coordination and the capacity for consistent implementation of national policies.¹

China has no Ministry of Energy at present. In June 2006, the World Bank and the Development Research Center of the State Council recommended the establishment of an energy ministry to coordinate energy policy at the cabinet level, but China has not acted on this recommendation.² Currently, the Energy Bureau of the National Development and Reform Council (NDRC) holds primary responsibility for energy policy coordination within the Chinese government. The Energy Bureau must approve significant energy-related projects such as the construction of power plants, and its internal departments have control over pricing of fuels and electricity as well as regulating industrial energy use.³ In addition to the NDRC, the Energy Leading Group and the State Energy Office, created in 2005 by the State Council led by Premier Wen Jiabao, play significant roles in China’s energy policymaking. The Energy Leading Group issues “guiding principles” about the direction of en-

ergy policy. The State Energy Office, led by Ma Kai, minister of NDRC, reports directly to the State Council, but has little political power and an unclear mandate.⁴ It is said to focus mainly on energy-related academic matters.⁵

This central government structure and the decentralization of policy implementation to local levels have created an unclear distribution of responsibilities. They have created a system that is easily influenced by local concerns for economic development. Local governments often prioritize these concerns over energy efficiency policies and environmental controls that—if implemented—could slow the pace of growth. Moreover, the flight of policymakers to the private sector has led to a loss of policymaking expertise, and an increase in the relative influence of China's energy companies. As Dr. Erica Downs of the Brookings Institution writes in her paper, "The Brookings Foreign Policy Studies Energy Security Series: China," "... the Chinese government relies on the energy companies for manpower and for their knowledge and experience."⁶ The Energy Bureau of NDRC and the State Energy Office lack the capacity and expertise to gather the statistical information needed to construct and implement effective energy policies, and this situation gives energy companies unwarranted influence over energy sector data and policy.

According to Dr. Downs, "The country's fractured energy bureaucracy has impeded formulation of a long-term national energy strategy accepted by all stakeholders." The lack of a clear bureaucratic infrastructure over energy policy, the lack of clear, detailed information, and the fear of disrupting the economy with a rapid policy change have to date prevented improvements in the development, coordination, and implementation of energy policy in China.⁷ Instead, Chinese energy policy has been created with "... a reactive management style, which approaches energy challenges by 'treating the head when the head hurts, treating the foot when the foot hurts.'" ⁸

The ad hoc reforms China has instituted in the energy sector have been at least in part a response to the pressure created by market reforms in other economic areas. As Mr. David Helvey, Country Director for China, Taiwan, and Mongolia at the U.S. Department of Defense, stated in testimony before the Commission, these pressures have created tension between the "dynamic elements of China's increasingly market-based economy" and "the Chinese Communist Party's desire to retain its monopoly on political power and control [of] its strategic industries and sectors of the economy including energy."⁹ Moreover, as incomes rise and a middle class develops, the Chinese people are beginning to apply pressure on the government to improve the environment and reduce industrial pollution, thus creating another energy-related concern for the government to consider.¹⁰

The central government has tried to balance these competing tensions by combining socialist and market-based principles in its energy policies. Mr. Saad Rahim, Manager of the Country Strategies Group at PFC Energy, described this approach as attempting "to capture most of the efficiency gains that come from reliance upon markets, while preserving much of the political stability made possible by an authoritarian state."¹¹ He argued that the govern-

ment's approach to energy is a microcosm of China's larger development strategy, in which continued, rapid economic growth is perceived as necessary for maintaining the credibility of the Chinese Communist Party leadership and for preserving social stability. In his testimony he stated, "Chinese officials realize that it is in their own best interests to limit future energy demand, and thus are amenable to pragmatic solutions as long as they do not perceive a direct economic threat from adopting them."¹²

Preserving an adequate supply of energy for China's rising demand—at a price that will not impose a significant burden on producers—is a vital prescription for maintaining an environment conducive to economic growth. For this reason, China defines "energy security" operationally as ensuring it has access to a stable supply of energy by controlling sources of production and the supply chain. As this relates to oil, consumption of which is rapidly growing in China, the government appears to distrust the international market to deliver reliable supplies because it fears China may at some point be denied access to the oil it needs, so it prefers long-term supply contracts for access to supplies in nations abroad with which China has developed bilateral political relationships. If a disruption to global supply occurs, other nations are concerned that Chinese companies will ship equity oil back to China and not add it to the global oil supply.

Given its perception of the global oil market, China has encouraged a "going out" strategy for its national oil companies whereby they seek equity oil assets in order to own the sources of production abroad. However, Assistant Secretary of Energy for Policy and International Affairs Karen Harbert testified that China will not be able to own enough of these resources to meet either its current or its future oil demand,¹³ implying that China, at least in part, will have to rely on the global market in order to fulfill its petroleum needs.

Faced with questions on the secure and reliable supply of energy as well as growing negative consequences of air and water pollution, China is beginning to adopt a strategy that diversifies fuel supplies and pursues clean energy alternatives. China's 11th Five-Year Plan highlights energy as a priority policy area for development, with a focus on conservation and energy efficiency to stem demand. The plan contains only two quantitative targets: the first is for GDP growth, and the second is for increased energy efficiency.¹⁴ China announced that it plans by 2010 to reduce energy consumption per unit of GDP by 20 percent.¹⁵ Even though it has succeeded in slowing the trajectory of its energy consumption growth, it has fallen short of the annual reduction targets necessary to meet its 2010 goal. China's National Bureau of Statistics reported that in 2006 China missed its announced target of a four percent reduction, and instead reduced consumption per unit of GDP by only 1.33 percent.¹⁶ However, the government has made several public statements about its continued commitment to reduce consumption. Additionally, China aims to increase the proportion of its energy needs met by renewable energy to 16 percent by 2020.

In June 2007, China announced a policy for addressing global climate change, in line with its obligations under the U.N. Frame-

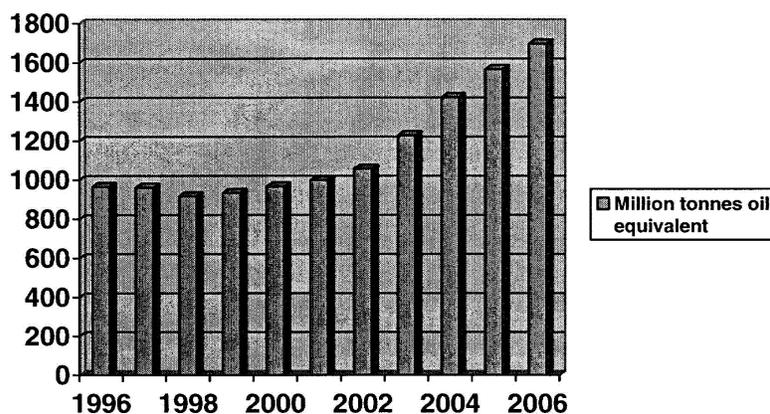
work on Climate Change. This plan acknowledges the problem of global climate change and China's contributions to the rising levels of greenhouse gases. The report highlights domestic policies that China will follow to address climate change, such as supporting research and development of energy technology, raising public awareness about energy conservation, increasing forest coverage, and addressing water shortages through more effective allocation of water resources.¹⁷ China does not accept the imposition of emissions caps on developing countries (a category in which it places itself for this purpose), arguing that such caps may restrict economic development. Nor will it accept the standards imposed on industrialized nations such as the United States. This plan nonetheless represents an attempt to participate in the international discussion on climate change and to ensure that China has a role in crafting the global response.

In addition, China is in the process of drafting an energy law to provide a legal framework for the development of energy policymaking and enforcement of related regulations.¹⁸ The draft of the law is expected to be completed by the end of 2007.¹⁹ While the effect of these two new initiatives is yet to be determined, these goals and policies reflect a change in rhetoric and suggest that China recognizes the need to mitigate unbridled energy demand growth and environmental pollution due to energy consumption trends.

Trends in China's Energy Demand

From China's initial implementation of economic reforms in the 1980s until today, its energy demand growth has averaged 3.9 percent per year, while its GDP grew an average of 9.8 percent per year.²⁰ However, in the past five years energy demand has grown at 13 percent per year, more than three percentage points above the average GDP growth.²¹

Figure 3.1 China's Primary Energy Consumption 1996–2006



Source: BP Statistical Review of World Energy, June 2007.

Mr. Trevor Houser, Visiting Fellow at the Colin Powell Center for Policy Studies at the City College of New York, and a Director of China Strategic Advisory LLC, explained that the growth in energy consumption has occurred due to provincial economic policies that focus on development of heavy industries such as steel and cement. These industries, which support China's urban development and exports abroad, are more energy intensive than light manufacturing industries. Given the decentralization of economic policy, the central government has little control over the economic practices of the provinces that are driving this industry growth, and heavy industries receive protection from provincial leadership because of their profitability.²²

As a result, industrial energy demand now equals 70 percent of China's total energy demand. The iron and steel industries alone account for 16 percent of that demand.²³ Incentives such as low environmental compliance standards, inexpensive land prices, and access to capital support the continued pursuit of these profitable heavy industries.²⁴ Consequently, industrial energy demand is expected to grow at a rate of 4.1 percent per year,²⁵ complicating Beijing's goals for energy efficiency and conservation.

While heavy industry growth is considered China's current energy challenge, the country's future energy challenge is consumption-led growth.²⁶ Rapid urbanization and rising urban incomes will lead to increased energy demand for residential and commercial and also for urban transportation needs. In the coming years, transportation-related energy demand is expected to grow more rapidly than any other area of energy use.²⁷ Dr. Lee Schipper, Director of Research for the EMBARQ program at the World Resources Institute,²⁸ argues that unsustainable development of China's transportation systems and an increase of vehicle ownership will be responsible for this increased demand.²⁹ A lack of urban planning has resulted in the unrestricted sprawl of many urban areas, and this pattern of development increases the population's reliance on cars to move around the cities. China's vehicle ownership is projected to increase from 25 million in 2007 to 140 million in 2020.³⁰ This increase will have significant consequences for urban use of space, energy consumption, and urban air quality.

Trends in China's Energy Consumption and Supply

Energy Consumption Trends

If current trends continue, both China's energy consumption and its share of global energy consumption will increase further in the future. In 2004, China consumed 40 percent less energy than the United States, but the U.S. Department of Energy predicts that by 2030 it will consume 11 percent more energy than the United States. Coal is expected to supply 65 percent of China's energy needs in 2030; oil will supply 22 percent; natural gas will supply 6 percent; renewable energy sources will supply 5 percent; and nuclear energy will supply 2 percent.³¹

A key obstacle to addressing consumption trends is China's poor energy efficiency relative to other countries. As Deputy Assistant Secretary of Energy for International Energy Cooperation David Pumphrey testified, "According to the National Development and

Reform Commission (NDRC), the level of energy efficiency in China is about 10 percentage points below that of more advanced countries.”³² In practical terms, this means that for every U.S. dollar’s worth of GDP, “Chinese producers consume 4.3 times more energy than their counterparts in the U.S., 7.7 times more than Germany or France, and 11.5 times more than Japan.”³³

Another obstacle to reducing its energy consumption is a lack of publicly-available data, particularly at provincial or local levels. In his testimony, Mr. Rahim noted that “[m]easuring energy use—like measuring economic activity—in an emerging economy such as China is always a challenge. In China, in particular, energy use can be politically sensitive—especially as relates to reporting between different level governments.”

Coal

Coal currently provides two-thirds of China’s energy supply. China is both the world’s largest consumer and the world’s largest producer of coal. China’s consumption of coal amounts to nearly one-third of all coal consumed worldwide,³⁴ and it has the world’s third largest proven reserves of coal, totaling 114.5 billion tons, or 13 percent of global coal reserves.³⁵ Last year, China’s coal production equaled 2.33 billion tons, and the National Development and Reform Commission announced that annual coal production will be capped at 2.6 billion tons by 2010.³⁶ China has approximately 30,000 coal mines, 80 percent of which are small mines.³⁷

While China sets the price of its domestically-mined coal at a level comparable to the international price, that price nonetheless is lower than the prices of other fuels in China, and coal remains the cheapest source of energy for most areas.³⁸ This is the primary reason that its share in China’s energy consumption picture is not predicted to decline absent government intervention or the deployment of strong market incentives to reduce its use.

Coal is primarily used for electricity generation, industrial power supply, and chemical feedstocks. Nearly 80 percent of China’s electricity needs are generated by coal-fired power plants, and—paralleling China’s economic growth—its electricity generation capacity has grown more than 11 percent each year since 2003, even as it has experienced power shortages. The Massachusetts Institute of Technology (MIT) study on *The Future of Coal* notes, “At this rate, China is adding the equivalent of nearly the entire UK power grid each year.”³⁹ Another comparison provided in testimony by Mr. Houser is that China’s addition last year of 100 gigawatts of new coal-fired capacity was more than the installed base of Africa.⁴⁰

Coal-based power will account for at least 400 gigawatts of the 600 gigawatts of new capacity that China will build between now and 2020.⁴¹ The International Energy Agency (IEA) reports that every week China installs a new coal-fired power plant.⁴² China plans to build 562 new coal-fired power stations by 2012.⁴³ China’s current construction of coal-burning plants and its plans for constructing others strongly suggest that the proportion of energy China derives from coal will not diminish significantly in the future absent substantial policy changes. According to the U.S. Department of Energy, China’s coal consumption for electric power is pro-

jected to grow at an average of 3.5 percent per year between 2004 and 2030.⁴⁴

Although China has a plentiful coal supply—sufficient to meet its needs and also to export coal to other nations—various transportation impediments have resulted in China importing considerable amounts of coal. Transportation costs make domestically-mined coal prohibitively expensive in some areas of China, such as Guangdong province, and in these areas it is cheaper to import coal or natural gas. In January 2007, tight rail capacity and transportation bottlenecks caused the government to conclude that it was much cheaper to import coal to coastal provinces than to transport coal to those areas by rail from the inland coal-producing provinces. Although this is not expected to be a permanent situation, it has caused China to become a net importer of coal, with imports coming primarily from Indonesia and Australia.⁴⁵ These imports, however, will not significantly change China's coal consumption or dependence.

Oil

Oil provides approximately 20 percent of China's energy supply. In 1993, China became a net oil importer, and in just fourteen years has grown to become the second largest oil consumer after the United States. In 2006, China's oil demand grew to 7.4 million barrels per day, of which it imports 3.6 million barrels per day.⁴⁶ The International Energy Agency estimates that by 2030 China's oil consumption will increase to 15 million barrels per day, equivalent to 13 percent of projected world oil demand.⁴⁷ Even with China's consumption at that level, the United States is projected to remain the largest consumer of oil—consuming 26.9 million barrels of oil in 2030.⁴⁸

While China's rapidly escalating consumption of oil has forced it to increase its oil imports in the past several years, the country is, in fact, the fourth largest petroleum producing country outside the Middle East and produces more than 50 percent of the oil it consumes. In 2006, the U.S. Energy Information Administration estimated that China produced 3.8 million barrels per day.⁴⁹ China recently discovered an oilfield in Bohai Bay in northeastern China, and China National Petroleum Corporation (CNPC) announced that the field holds about 7.35 billion barrels.⁵⁰

Although this discovery does not significantly affect China's energy security, it indicates that domestic exploration and production can assist in securing the amount of oil China needs. Despite this discovery, however, China's domestic production capacity has peaked or is declining, thereby suggesting that China's reliance on oil imports will grow in the future. China's two largest suppliers of oil imports are Angola and Saudi Arabia, supplying an average of 525,000 barrels per day and 465,000 barrels per day, respectively.⁵¹ China's joint venture holdings in Sudan produce approximately 350,000 barrels per day, although only 140,000 barrels per day of this equity oil are under the control of the China National Petroleum Company.⁵² While China is dependent on Middle Eastern oil, China also seeks imports from Africa, Central Asia, Latin America, and North America. China's oil imports are predicted to

increase from approximately 3 million barrels per day in 2005 to between 6 million and 11 million barrels per day by 2020.⁵³ By 2030, China is expected to rely on oil imports for 69 percent of its oil supply.⁵⁴

Consistent with China's definition of energy security—which supports ownership of resources “in the ground”—China's equity oil production has been increasing in recent years. Chinese oil companies have equity contracts and operations in more than 30 countries.⁵⁵ The Chinese government and its state-owned oil companies do not officially publish figures about how much equity oil is derived from overseas investments and whether it is transported to China.⁵⁶ However, Mr. Houser estimated in his testimony that last year China's three largest national oil companies produced 690,000 barrels of equity oil per day,⁵⁷ compared to approximately 370,000 barrels of equity oil per day in 2004.⁵⁸ Mr. Houser also testified, based on Customs statistics, that approximately 250,000 barrels of oil produced abroad by China's oil companies are transported to China for use there, and the remaining quantity is sold into the global market.⁵⁹ For example, a Eurasia Group report commissioned in 2006 by the Commission noted that while China has investments in Syrian oil production, available customs data on oil imports by China do not show any imports in recent years from Syria. The deduction from this observation of the report is that the oil produced by Chinese joint ventures in Syria is being sold and used elsewhere rather than being transported to and consumed in China.⁶⁰

In pursuit of equity production, China's national oil companies are aggressively entering the global oil market and working in countries where international oil companies have not invested due to conflict, political instability, or human rights concerns. Most national oil companies do not rely on capital from the government to fund equity investments, and Mr. Rahim noted that the “going out” strategy of foreign exploration and production is not viewed by China's oil companies as a guarantor of energy security, but rather is seen as an opportunity to gain experience in the global market and make a profit.⁶¹ Several witnesses testified to the Commission that it appears China's state-owned oil companies made equity investment decisions for commercial and profitability reasons, but it is unclear to what degree these investments also are motivated by government policies. It is known that China's national oil companies are not subject to many of the government-imposed conditions, limitations, and mandates imposed on multinational oil companies by Western governments.⁶² (See Chapter 3, Section 3 for further discussion of equity oil investments.)

China National Petroleum Corporation (CNPC) is China's largest upstream oil company with equity production of 329,810 barrels per day in 2004.⁶³ The nations in which Chinese equity production is greatest are Sudan and Kazakhstan.⁶⁴ Equity production in Sudan equals about 140,000 barrels per day, in oil fields partially controlled by CNPC.⁶⁵ CNPC also owns assets in Kazakhstan that produced approximately 200,000 barrels per day in 2007.⁶⁶ It is expected that oil imports from Kazakhstan will increase to 400,000 barrels per day in the next few years, as China continues to invest in oil production there.⁶⁷ Additionally, in June 2007, CNPC pur-

chased the rights to explore and develop a Canadian oil sands field, which is estimated to hold two million barrels.⁶⁸

While Chinese companies are actively seeking foreign oil assets, the majority of China's oil imports originate from the "spot market"—the international open market. Not surprisingly, China's domestic oil pricing system is dependent on world crude oil prices. The government, however, controls downstream prices of gasoline and other refined products, and their artificially controlled prices foster consumption and increased energy demand. The controlled prices also can reduce production and transportation costs for manufactured goods—which lowers the price of exports and effectively subsidizes them.

Given the artificial ceilings placed on downstream petroleum products, refiners are caught in a major non-market economic squeeze. Messrs. Houser and Daniel Rosen of China Strategic Advisory LLC write, "As the price China paid for its imported crude doubled between 2004 and 2006, refiners . . . lost money with each barrel processed. In 2006 the refining industry as a whole lost over \$5 billion."⁶⁹ Since 2003, China has increased prices for refined oil products 12 times, but in January 2007 lowered the prices of gasoline and kerosene to correspond with fluctuations in international oil prices.⁷⁰

Also in January 2007, China opened the wholesale oil market to foreign-owned oil companies, and issued regulations on the distribution, storage, and sale of retail products.⁷¹ While certain restrictions apply to such investment, this change represents a positive step toward improving China's energy infrastructure, as private foreign companies will seek to invest in the development of China's oil retail market and distribution infrastructure.

Natural Gas

Natural gas historically has not been an important energy source for China, comprising only about three percent of its energy supply. China has limited domestic natural gas reserves and limited domestic production offshore and in inland provinces.⁷² Therefore, in the future China will rely on imports to meet more than 40 percent of its natural gas demand.⁷³ China already imports natural gas from Australia into Guangdong province.⁷⁴ Additional terminals are being constructed in Fujian province and in Shanghai. Shanghai began constructing a terminal in January 2007 for receiving liquefied natural gas, and it is expected to begin operations in 2009. The terminal will be supplied through a 25-year contract with Petronas, a Malaysian oil company.⁷⁵

In June 2007, China began regulating imports of natural gas in order to reduce domestic competition among its oil companies. According to the Ministry of Commerce, the competition between CNPC, China Petroleum and Chemical Corporation (Sinopec), and China National Offshore Oil Corporation (CNOOC) in purchasing natural gas on the international market enabled exporters to raise prices for Chinese imports. The effect of the new regulations in "[b]ringing gas imports under unified control will be conducive to increasing the influence of major Chinese buyers on the market."⁷⁶ This move reflects China's distrust of international oil markets,

and demonstrates its willingness to interfere with the operation of its national oil companies in order to protect China's larger interests.

The NDRC Energy Bureau controls natural gas prices in the Chinese market, but these prices may vary by province.⁷⁷ Beijing has lowered natural gas prices specifically for power generation in an attempt to encourage the use of gas instead of coal, but power producers have not dramatically increased their use of natural gas.⁷⁸ Barriers to expanded natural gas use include a limited distribution infrastructure, high investment costs for building that infrastructure, and a price structure that still leaves the price of coal lower than the price of gas.⁷⁹ Indeed, Mr. Rahim testified that natural gas is the most underexploited source of energy in China.⁸⁰

As long as coal remains a cheaper source of fuel, consumers will be inclined to choose it rather than more expensive natural gas.⁸¹ Nonetheless, growing costs for coal transportation, the environmental costs of coal burning that increasingly are being recognized and protested in China, and improvements in the infrastructure for natural gas distribution facilitate the emergence of natural gas as a competitor. The U.S. Energy Information Administration estimates that China's natural gas consumption will increase by an average of 6.8 percent each year between 2003 and 2030, to comprise six percent of China's energy supply.⁸² Although this will not alter China's energy fuel mix significantly, it will provide more options for provinces, especially coastal provinces, to improve their energy security and their air quality simultaneously.

Nuclear

As China struggles to lower high levels of emissions from coal-fired power plants, nuclear energy has emerged as an important option for diversifying China's energy supply, moving it away from dependence on coal. Nuclear energy provides only about one percent of China's current energy supply, but by 2020, China's nuclear capacity is expected to expand five times from the current 8,000 megawatts to 40,000 megawatts.⁸³ The majority of this expansion will occur in coastal provinces where coal transportation costs are highest. Although nuclear power still will constitute a small share of China's total generated power—approximately three to four percent,⁸⁴ this reflects a shift in the government's energy supply strategy. This strategy calls for increasing nuclear energy output, but this will not appreciably alter the current percentage of China's total consumption attributable to nuclear power.

The China National Nuclear Corporation and China Guangdong Nuclear Power Holding Company operate China's existing nuclear reactors. In May 2007, the State Nuclear Power Technology Company was created by the State Council and four state-owned enterprises to lead efforts to sign contracts to construct third-generation nuclear power facilities. China's nuclear power companies will benefit from the transfer of technology that will improve China's current second-generation nuclear energy capabilities. The State Council financed 60 percent, or 2.4 billion renminbi, of the registered capital of the company.⁸⁵

The Administration and the U.S. nuclear power industry have been actively working in concert to help jumpstart China's nuclear energy expansion. Secretary of Energy Samuel Bodman and NDRC Minister Ma signed a Memorandum of Understanding concerning nuclear energy cooperation that restates U.S. approval to export third-generation nuclear technology to China.⁸⁶ GE-Westinghouse Electric Company and China's State Nuclear Power Technology Corporation signed an agreement in March 2007 to build four third-generation pressurized water reactors—two in Sanmen, Zhejiang Province, and two in Haiyang, Shandong Province—with Westinghouse's AP1000 technology. Westinghouse outbid France's Areva and Russia's Atomstroiexport in a negotiation that began in 2004. Both parties agreed that a formal contract would be signed before the end of May 2007. In mid-May, three Chinese nuclear power companies signed a Memorandum of Understanding with Westinghouse and the Shaw Group, again stating their intention to develop a contract for this sale,⁸⁷ and the final contract was signed in July 2007.⁸⁸

This project will introduce the first AP1000 reactors to be built in China and is estimated to be worth \$5.3 billion.⁸⁹ According to Deputy Assistant Secretary Pumphrey, "The AP1000 Westinghouse design adopts passive safety features and simplified design for enhanced safety and cost effective construction."⁹⁰ The U.S. Nuclear Regulatory Commission certified this technology complies with non-proliferation safeguards for use and sale abroad.⁹¹ Nonetheless, given concerns about China's proliferation history, questions remain about the possible impacts of these sales.

China's interest in nuclear power is extending in a number of directions. According to *Xinhua* news agency, "The Chinese government ... expected the new company [State Nuclear Power Technology Company] to develop self-owned, third-generation nuclear power technologies using technologies imported from Westinghouse, to build a fifth plant."⁹² China has joined the Generation IV Forum, a multilateral research initiative to develop a fourth-generation nuclear technology with higher safeguards.⁹³

Renewable Energy

In recent years, China has expanded its use of renewable energy as part of its diversification strategy. China is now the eighth largest wind power producer in the world.⁹⁴ China's wind power generation capacity increased 165 percent last year to equal 1,330 megawatts.⁹⁵ China's planned wind power target is 20,000 megawatts by 2020.⁹⁶ Currently wind power is mainly concentrated in Xinjiang, Inner Mongolia, and Guangdong. During the April 2007 visit of a Commission delegation to China, the delegation visited a General Electric wind turbine factory located in Shenyang. According to GE representatives, demand for wind turbines is increasing in China as the government seeks to diversify its energy resources. GE faces competition from local manufacturers, primarily because the local firms are able to source their components domestically. The more components that American firms must import, the more expensive the assembly of turbines becomes. For

this reason, firms are being forced to localize the supply of their parts in order to remain competitive in the Chinese market.

China also has ambitious plans for expanding its solar power capacity. Beijing aims to install three megawatts of solar power for the 2008 Olympics. By 2010, China plans to consume 300 megawatts of solar energy, even though last year China's solar power consumption was less than 10 megawatts. China has patented solar water-heater technology that lessens its reliance on imported solar technology. However, China does rely on imports of polycrystalline silicon, or polysilicon, that is required for solar cell production. China's solar power efforts face a significant economic hurdle because traditional energy sources usually are less expensive and the majority of people in China do not have large amounts of disposable income. Primarily as a result of this situation, China currently exports 90 percent of its solar cell production.⁹⁷

Additionally, China is the largest consumer of hydroelectric power in the world, and with new projects coming online, this capacity is expected to expand. China currently has 86,000 dams, 22,000 of which are considered large dams.⁹⁸ Hydroelectric power provided approximately 16 percent of China's electricity needs in 2005.⁹⁹ In numerical terms, China plans to expand capacity from 120 gigawatts to 300 gigawatts by 2020. As Mr. Houser testified, this would require China to construct a new Three Gorges-sized dam every year for the next 13 years to meet this target¹⁰⁰—a seemingly unattainable goal, the achievement of which also would have significant impacts on China's water supply and environment.

Dr. Elizabeth Economy, C.V. Starr Fellow at the Council on Foreign Relations, stated in written testimony for the Commission that although hydropower has the significant virtue of not contributing airborne pollutants or carbon dioxide, it is a very mixed blessing. The dams and reservoirs required to produce hydropower have caused declines in biodiversity, soil erosion, water pollution, loss of cultural sites, and the necessity to resettle entire towns and villages.¹⁰¹

The government has taken steps to encourage the use of renewable energy, expand U.S.-China cooperation in this field, and support the introduction of renewable energy technologies in the market. In 2005, the National People's Congress passed the Law on Renewable Sources that went into effect in 2006. This law is intended to expand use of renewable energy in order to meet the goals set by the 11th Five-Year Plan. Among the new law's provisions is a requirement that "power grid operators ... purchase 'in full amounts' resources from registered renewable energy producers."¹⁰² These operators must purchase renewable energy—such as solar power, wind power, or hydropower—at prices controlled by the government. The law also provides financial incentives such as tax breaks for renewable energy projects.¹⁰³

Despite these efforts, barriers to the use of renewable energy still exist. Wind turbines and solar panels require a significant investment, and state-controlled prices for electricity reduce the incentive to make the investments needed to diversify power production. In addition, many American firms, including some with whose representatives the Commission delegation met during its trip to China in 2007, are concerned about the theft of intellectual prop-

erty, given the high research and development costs for new technology.¹⁰⁴ Foreign manufacturers face competition from local companies that do not face the same transportation costs for components. This situation requires companies to localize supply chains in China in order to be price competitive, which supports the overall development of the renewable energy industry but also significantly raises the risk of intellectual property rights violations as well as the risk that the enterprises established by foreign firms will never recover their initial investments, much less produce profits.

Conclusions

- The lack of policy coordination and implementation between the central government and local or provincial levels of government is hindering China from achieving greater gains in energy efficiency, promoting greater use of alternative fuels, and mitigating the environmental consequences that result from China's dependence on coal. If this structure is not reformed, the Chinese government will not have, for the foreseeable future, the administrative tools necessary to reform China's domestic energy consumption patterns, and also will be limited in its ability to address global energy problems proactively.
- As incomes rise in China and the economy becomes more consumption-oriented, effective conservation programs will be essential if energy demand growth is to be limited. China will have to pay close attention to mitigating the effects of energy-intensive and heavily polluting consumer items such as automobiles and air conditioners, which will require government regulation or market-based incentives that influence consumer choices on such items. Changing consumer demand also will affect the composition of China's fuel needs, likely increasing China's use of oil and natural gas, which will increase global demand for both.
- China is pursuing an energy diversification strategy that seeks to find cleaner alternatives to coal. However, as long as the environmental costs of burning coal are not built into coal's price, the degree of diversification into natural gas, nuclear power, and renewable energy sources will have little impact on the complexion of the fuel supply, and China will continue to rely on coal as its primary energy source and increase its reliance on oil. This has long-term negative environmental and strategic consequences for the United States, but also raises opportunities for U.S.-China collaboration on clean coal technologies.

SECTION 2: CHINA'S ENVIRONMENTAL SITUATION

“The Commission shall investigate and report on—

“ENERGY—The effect of the large and growing economy of the People’s Republic of China on world energy supplies and the role the United States can play (including joint research and development efforts and technological assistance), in influencing the energy policy of the People’s Republic of China.”

The Environmental Effects of China’s Energy Consumption on China and the United States

Burning carbon fuels to produce energy yields byproducts that pollute the atmosphere and also have the potential to affect water supplies. While this process certainly is not unique to China, the patterns of China’s energy consumption, and the ways in which the government has viewed and addressed environmental consequences of that consumption, have produced and are continuing to produce severe immediate and long-term environmental consequences that have large economic and social costs.

The primary contributor to energy-related pollution is coal burning for electricity generation. Coal-fired plants emit carbon dioxide, sulfur dioxide, nitrous oxide, mercury, and black carbon dust. It is estimated that China’s coal consumption is responsible for 25 percent of global mercury and 12 percent of global carbon dioxide emissions.¹⁰⁵ China’s State Environmental Protection Administration (SEPA) has estimated that China’s sulfur dioxide emissions—the main component of acid rain—have increased 30 percent since 2000.¹⁰⁶ U.S. Environmental Protection Agency (EPA) Assistant Administrator for International Affairs Judith Ayres noted in her testimony to the Commission that the average concentration of fine-particle pollution in Beijing is seven times higher than the air quality standards set by the U.S. EPA.¹⁰⁷

Coal produces more carbon dioxide per unit of energy than any other fossil fuel. Although the Chinese government has not released official statistics on carbon dioxide or mercury emissions since 2001, Assistant Secretary of Energy for Policy and International Affairs Karen Harbert testified that China will overtake the United States as the world’s largest emitter of carbon dioxide before 2010.¹⁰⁸ Other estimates are that China will reach that point much sooner, and by some calculations it already has done so. A Netherlands-based environmental research group reported in June 2007 that “China overtook the U.S. in emissions of [carbon di-

oxide] by about 7.5 percent in 2006.”¹⁰⁹ Although China disputed this report, there is a broad consensus in the global scientific community that China either already is, or soon will become, the world’s largest emitter of greenhouse gases. By 2030 China is projected to account for 26 percent of the world’s carbon dioxide emissions and 48 percent of all coal-related emissions.¹¹⁰

China’s air pollution includes pollution generated by transportation vehicles and indoor air pollution. Due to the dramatic rise in the number of vehicles in use in China (described in Chapter 3, Section 1), byproducts of fuel combustion by transportation vehicles are contributing significantly to urban air pollution.¹¹¹ Nitrogen oxide from motor vehicles generates ozone.¹¹² Although trucks and cars are the most prolific vehicle pollution sources, rail transport and shipping also contribute to urban air pollution. During a Commission delegation’s trip to China and Hong Kong in April 2007, environmentalists with whom the delegation met in Hong Kong noted the impact of shipping-related pollution on Hong Kong’s local air quality. Because ships are unable to link to shoreline power there, they burn fuel continuously while docked, producing emissions that are concentrated at ground level. The U.S. EPA has identified this as a problem in the United States and is working with the shipping industry to reduce port pollution.¹¹³

Indoor air pollution caused by burning solid fuels—such as coal briquettes and biomass—for household heating and cooking contributes to nearly 400,000 deaths in China annually, according to the World Health Organization.¹¹⁴ The World Health Organization’s report *Indoor Air Pollution: National Burden of Disease Estimates* states, “Exposure to indoor air pollution from solid fuels has been linked to many diseases, including acute and chronic respiratory diseases, tuberculosis, asthma, cardiovascular disease, and perinatal health outcomes.”¹¹⁵ It reported that 80 percent of the population in China uses solid fuels,¹¹⁶ indicating that a high percentage of the population is exposed to these risks. The full effects of this pollution are not yet understood because environmental data within China are meager and often exist only as aggregate data across many jurisdictions.¹¹⁷

The effects of the pollution China generates by no means are limited to China, although China suffers most from them. As one example, high levels of mercury traced to emissions in China threaten watersheds and wildlife in Oregon.¹¹⁸ Assistant Administrator Ayres noted in her testimony that the ability of aerosols—airborne microscopic particles—to travel great distances is well documented. The difficulty typically is to trace a pollutant to its source. However, Dr. Jane Long, Associate Director of the Energy and Environmental Directorate at Lawrence Livermore National Laboratory, testified that the Laboratory has conducted a study tracing the path of aerosols from China, which it recently submitted for publication. This study concludes that 40 percent of the aerosols in the Sierra Nevada Mountains of California are attributable to China.¹¹⁹ While this study did not chemically match the aerosols it studied to aerosols produced in China, a mechanical analysis of airstream data was conducted by the researchers, leading to their conclusions about the geographical sources of the aerosols they identified.¹²⁰

The situation with aerosol pollution traveling to the United States from China is not an isolated case. Additional studies reported in U.S. media confirm that satellites have observed dust, soot, ozone, and nitrous oxide as they are blown across the Pacific at high altitudes. Dr. Dan Jaffe, from the University of Washington-Bothell, is involved with these studies. In a media interview he stated, "By looking at the ratios of different pollutants, particularly carbon monoxide and mercury, we can actually say the ratio of these pollutants we are seeing . . . matches the ratio of pollutants coming right out of China."¹²¹

The Chinese government has enacted laws and regulations placing caps on sulfur emissions and requiring coal-fired power plants to reduce pollution, but only a small fraction of the plants subject to those laws and regulations have installed flue gas desulfurization (FGD) technology to capture sulfur dioxide from emissions.¹²² Dr. Mun S. Ho, Visiting Scholar at Resources for the Future, testified, "These systems use about two percent of the electricity generated, i.e. the gross revenues of the utility [are] reduced by about two percent as a result of this rule."¹²³ In his opinion, this cost creates a strong incentive for businesses to cheat on environmental pollution controls.

Regrettably, China's weak environmental regulatory and enforcement system does very little to prevent or effectively penalize those who ignore or skirt the laws and regulations. Indeed, the primary obstacle to improving emissions control in China is not a lack of access to effective technologies and equipment; instead, it is the inability or unwillingness of the central government to monitor, appropriately incentivize, and compel environmental compliance at the local level.

Dr. Jennifer Turner, China Environment Forum Coordinator and Senior Project Associate at the Woodrow Wilson International Center for Scholars, testified about the ominous implications: "The expansion of China's power plants alone could nullify the cuts required under the Kyoto Protocol from industrialized countries."¹²⁴ Within the United States, there is concern that China's transboundary air pollution may more than offset the progress that California, Washington, and Oregon are making toward pollution reduction targets set by the Clean Air Act.¹²⁵

According to Dr. Ng Chonam, a professor at Hong Kong University who focuses on environmental impact assessments and with whom Commissioners met in Hong Kong in May, China's unimpeded energy consumption, especially by its industries, results not only in air pollution but also in water shortages and water pollution.

Water pollution caused by the byproducts of fuel combustion is not the only threat to China's water quality. Dumping of the toxic wastes from manufacturing and agricultural operations; disposal of untreated or inadequately treated sewage; return to rivers of wastewater resulting from washing coal and other mining operations; and runoff of agricultural chemicals and animal waste also have resulted in distressing water pollution. Increasingly, water conditions in many of China's lakes and rivers threaten human health or are truly deadly. Surface water pollution often does not confine itself to the surface. Polluted water frequently finds its way

into underground aquifers. Polluted groundwater, which often is used as a source of well water by individuals or even entire communities, can be just as harmful to human and other life as polluted surface water; and once polluted, aquifers are far more challenging and expensive targets for pollution mitigation efforts than surface water.

Water shortages brought about by the inefficient use and overconsumption of water resources often result in salinization of freshwater resources. When the water in freshwater rivers is so depleted by overuse that river flows into the ocean cease or are substantially curtailed, a seawater surge is often the result, resulting in saline pollution of surrounding riverbanks and other ecological harm.

Pollution from Coal Mining

Air pollution is not the only environmental consequence of China's dependence on coal as a primary fuel source. Coal mining produces air, land, and water pollution. The country has approximately 30,000 coal mines, and the cumulative effect of China's mining practices has devastating environmental consequences. These consequences include methane emissions, toxic wastewater, dangerously polluted wasteland inhospitable to human and animal habitation, and land collapse.¹²⁶ Methane is a greenhouse gas that is 23 times more effective in trapping heat in the atmosphere than carbon dioxide,¹²⁷ and China is the largest emitter of coal mine methane in the world.¹²⁸ Coal mining pollutes surface and groundwater when wastewater is discharged from mines without any treatment. This polluted water can affect agricultural production as well as public health.¹²⁹ Additional health effects from coal mine pollution include lung disease, hearing loss, neuromuscular disorders, and rheumatism among mine workers.¹³⁰ In 2002, 70,000 Chinese miners suffered from black lung disease, and over 2,000 died from the disease.¹³¹

Dr. Jennifer Turner illustrated the effects of coal mine pollution on a local population in her testimony to the Commission:

Linfen—a major coal mining city in Shanxi Province—has been dubbed the most polluted city in the world by the World Bank. The coal industry has greatly boosted the city's economic development; however, it has led to the dramatic deterioration of the environment and a rise in major health problems. Crops are covered in [gray] dust and considered toxic, and the coal pollution dust is so great cars must use headlights during the day. City residents suffer from respiratory illnesses from the severe pollution generated by dozens of coal mines surrounding the city.¹³²

The Economic and Social Impacts of China's Environmental Degradation

China is finding that environmental degradation has costs—both economic and social. According to Assistant Administrator Ayres, “It has become abundantly clear to the Chinese that a poor environment is affecting their economy and that the damage they have done and the degradation that they now must suffer and attempt to remediate is having economic consequences.”¹³³ Last year, the Chinese government officially estimated the cost of environmental damage as three percent of gross domestic product (GDP).¹³⁴ However, Ms. Ayres testified that China's State Environmental Protection Administration, in contrast, estimates that environmental degradation costs China eight to 13 percent of GDP annually. She noted that air pollution alone costs two to four percent of GDP.¹³⁵ In 2007 the PRC National Bureau of Statistics declined to release information about the cost of pollution relative to GDP, noting that “the study has prove[n] to be too sensitive to continue, and it has been suspended.”¹³⁶

Pollution due to China's energy consumption not only has a macroeconomic impact, but also affects the basic productivity of China's cities and provinces. Black carbon soot blocks sunlight and is estimated to be lowering crop yields by 30 percent for grain crops in China.¹³⁷ The Worldwatch Institute estimates that acid rain and smog produced from coal burning cost China \$13 billion per year in damages to crops, forests, and human health.¹³⁸ The World Health Organization found that over half the damage caused by acid rain in China occurs in three provinces: Guangdong, Zhejiang, and Jiangsu. Almost half the acid rain damage *to crops* in China occurs in Hebei, Hunan, and Shandong provinces.¹³⁹

Air pollution also affects China's investment climate. International investors such as Merrill Lynch have called air pollution produced in Guangdong province a risk to Hong Kong's competitiveness because it reduces Hong Kong's appeal as an investment location and commercial hub.¹⁴⁰ China has 16 of the 20 most polluted cities in the world, according to the World Health Organization, and the population in those cities faces increased health risks due to elevated levels of sulfur dioxide and nitrogen oxide.¹⁴¹ International investors are reluctant to risk the health of their employees or damage to their investments by locating in highly polluted areas.

Air pollution has been linked to premature mortality and chronic respiratory problems.¹⁴² Dr. Ho testified that, based on his studies of the economic costs of air pollution, he conservatively estimates that 94,000 Chinese die prematurely every year due to severe air pollution. Other estimates indicate that air pollution contributes to 400,000 premature deaths per year.¹⁴³ Further, 1.4 million cases of chronic bronchitis and 1.3 billion lost work days are associated with air pollution.¹⁴⁴ Both air and water pollution have been linked to increased rates of cancer in both rural and urban areas,¹⁴⁵ which results in increased morbidity, losses in labor productivity, and strain on the health care system. In her statement to the Commission, Dr. Elizabeth Economy of the Council on Foreign Relations noted that the impact on public health from coal-based pollu-

tion alone is projected to cost China \$39 billion in 2020.¹⁴⁶ These troubling public health status and health care cost trends are not expected to improve in the future.

Along these lines, the Chinese government's recent decision to refuse to release two reports quantifying the impact of air pollution on public health and the cost of China's pollution to its gross domestic product (GDP) is not a fortuitous indicator.¹⁴⁷ Without public information detailing and quantifying the costs of pollution to China and the Chinese people, it will be more difficult for the government to take the steps necessary to reduce pollution, establish monitoring baselines, and motivate the public to participate in energy conservation and environmental awareness efforts.

The cumulative effects of pollution could have political ramifications for Beijing. The growing middle class in China is increasingly aware of and attentive to quality-of-life issues, including the environment in which they live.¹⁴⁸

Protests in Xiamen in June against the construction of a chemical plant were reported in the press as the "nation's largest middle-class rally in years."¹⁴⁹ Xiamen residents organized two days of demonstrations through the use of instant text messages on cell phones despite the efforts of Public Security Bureau technicians to block these transmissions.¹⁵⁰ Police arrested and denied bail to at least four residents who attended the protests.¹⁵¹ Days following the Xiamen demonstrations, Beijing residents protested against the construction of a waste incinerator in northwest Beijing.¹⁵² In both these cases, residents protested the lack of public information about the environmental risks that these projects posed to the local population, and forced officials to reconsider and delay the projects, demonstrating the potential for public involvement in matters with environmental impacts.¹⁵³

In July 2007 Zhou Shenxian, the leading minister of the State Environmental Protection Administration, publicly blamed the increasing instability across the country—reflected in riots, protests, and petitions—on the public's anger toward the country's polluted environment.¹⁵⁴ He chided local officials for not standing up to environmental polluters whom he labeled as the cause for a rising number of "mass incidents."¹⁵⁵ These incidents demonstrate the potential for Chinese citizens to become involved on a local level in environmental monitoring and enforcement. But it is not yet certain whether the Chinese government is willing to accept this participation on a large scale, and will provide the policy tools by which members of the public can channel their participation in ways the government will accept, but that also yield positive changes. Without comprehensively addressing energy-related environmental pollution, the government is likely to face increased protest and challenges to the political system, especially directed toward local officials who protect industrial polluters.

Conclusions

- China's national leaders recognize that a failure to enforce environmental controls on pollution has significant economic and social costs. However, the government has not yet taken steps to ascribe value to environmental compliance that equals or exceeds

the value placed on economic growth. Continued lax enforcement may have consequences for the sustainability of China's economic growth.

- If China's underlying environmental problems are not addressed effectively, this could become another source of unrest that could challenge the Chinese Communist Party's control of the country.
- China soon will overtake the United States as the largest emitter of greenhouse gases in the world, if it has not already done so. China currently is the largest national source of coal mine methane and is poised to become the largest national source of carbon dioxide. Global climate change initiatives will not work without China's participation.
- The effects of China's energy-related pollution are far-reaching, extending to the United States and beyond. China lacks adequate data and public information to assess accurately changes in its energy consumption and resulting environmental consequences, especially at the provincial and local levels. Greater availability and transparency of data can improve the central government's ability to make and implement sound energy policy, and assist the United States in understanding more clearly the mutual energy and environmental challenges facing both countries. Additionally, more accurate data can facilitate deployment of green energy technology, much of which is developed in the United States.

SECTION 3: THE GEOSTRATEGIC IMPACT OF CHINA'S ENERGY POLICIES AND ACTIVITIES

“The Commission shall investigate and report on—

“ENERGY—The effect of the large and growing economy of the People’s Republic of China on world energy supplies and the role the United States can play (including joint research and development efforts and technological assistance), in influencing the energy policy of the People’s Republic of China.”

China’s Search for Energy Security and the Impact of Pursuing Equity Oil

China’s concern over access to resources including oil has become an important influence on its strategic behavior.¹⁵⁶ Mr. David Helvey, Country Director for China, Taiwan, and Mongolia for the U.S. Department of Defense, testified to the Commission that “China’s response to its energy needs has led Beijing to finance energy projects that have uncertain prospects for a positive return on investment, to ignore political risk that is prohibitive to private commerce, and to establish closer relations with problem states that are rich in energy but that defy international norms.”¹⁵⁷ These steps entail significant risks, confirming the great importance China’s leadership attaches to pursuing a sufficient energy supply.

China’s energy-related actions reflect its distrust of international oil markets—which it sees as primarily dominated by the United States—and call attention to the motivations behind China’s national “going-out” strategy described in Chapter 3, Section 1. In order to ensure an adequate petroleum supply for its domestic consumption needs, China has chosen to establish long-term supply contracts to purchase oil produced in other nations, rather than relying on the market-based acquisition mechanisms of the international oil market; and to encourage its companies to pursue ownership of oil production in overseas fields. This approach, based on what essentially is a zero-sum perspective of the global oil market, challenges the current multilateral perspective on energy cooperation.¹⁵⁸

This policy has political and security consequences for China. The “going-out” strategy supports the expansion of China’s oil companies into overseas oil production and the acquisition of equity oil contracts to develop and produce new resources (see Chapter 3, Section 1). Congruent with this policy is China’s overall foreign policy approach that seeks to expand China’s influence around the world and promote a perception that China is willing to offer aid

and development assistance to developing nations while not interfering in their internal affairs. Thus, in the past, China's search for equity oil often has been supported by the development of official political relationships.

Witnesses testified to the Commission that China's national oil companies—while majority state-owned—may have begun to act independent from the government in their pursuit of the “going-out” strategy, and make investment decisions based on projected commercial returns rather than national policy (see Chapter 3, Section 1). Messrs. Daniel Rosen and Trevor Houser write in their paper “China Energy: A Guide for the Perplexed,” “[China National Petroleum Corporation] (CNPC), [China Petroleum and Chemical Corporation] (Sinopec), and [China National Offshore Oil Corporation] (CNOOC) have used political clout to get supportive high-level state visits, access to subsidized capital, or development assistance money designated for infrastructure projects. This sometimes contradicts Beijing's desire to sink additional investment into mature, less profitable fields at home in order to prop up declining domestic production.”¹⁵⁹ Mr. Mikkal Herberg, Research Director of the Asian Energy Security Program at the National Bureau of Asian Research, testified that the energy firms' actions, contradicting government preferences, may be linked to the companies' competitiveness. As the companies become more competitive internationally, they seek to be more independent from the government's influence. Moreover, their interests may diverge from the state's interests.¹⁶⁰

When the practices or actions of China's oil companies operating in other countries engender local discontent or international concern, Beijing must seek to repair relationships not only with the countries in which the problems have occurred, but also with international organizations and other nations that promote responsible activity by companies investing in developing countries.

Sometimes local antipathy to Chinese investments and activities endangers those investments and Chinese personnel who are implementing them. For example, in September 2006 Sinopec was ordered to halt all exploration operations in Gabon after it was discovered that the company was operating in a national park without having received approval from Gabon's Environment Ministry for its environmental impact study. “Sinopec was accused of dynamiting and polluting Loango National Park, tearing up the forest to create roads, and generally destroying the habitat . . .”¹⁶¹

In January 2007 Nigerian gunmen kidnapped nine Chinese employees of CNPC working in the southern state of Bayelsa and demanded ransom.¹⁶² In April 2007 rebels attacked a Chinese-run oil field in Ethiopia, killing nine Chinese workers and kidnapping seven.¹⁶³ Although the Chinese workers were not directly targeted by the rebels, the Ogaden National Liberation Front released a message stating, “We will not allow the mineral resources of our people to be exploited by this regime or any firm [with which] it enters into an illegal contract.” In 2007 China conducted several exercises aimed at simulating hostage situations. Although these exercises generally were conducted within the context of counterterrorism and preparation for the 2008 Olympic Games, it is important to note that these skills could be applied by Chinese

special forces and People's Armed Police in any hostage situation that Chinese workers abroad might face.¹⁶⁴

In particular, China's relationships with Iran, Burma, and Sudan have resulted in criticism from Western countries that prohibit their oil companies from operating in these countries for political and human rights reasons. China has resisted taking steps to resolve the political and human rights conflicts in Iran and Burma. It has supported some U.N. resolutions addressing Iran's nuclear program, but has not reduced its investments or activities pertaining to Iran's petroleum supplies. It has not supported U.N. resolutions addressing human rights problems in Burma or taken any other discernible action to seek a responsible solution there.

In Sudan, China recently has taken minimal steps to encourage the Khartoum government to accept the U.N.-African Union peacekeeping force and to discuss ways to address the genocide in Darfur. China has voted in favor of U.N. Security Council Resolution 1769, which established a U.N.-African Union hybrid peacekeeping force in Darfur (UNAMID) consisting of 19,555 military personnel.¹⁶⁵ China also has made statements that support peace in Sudan. The press reported that China's President Hu Jintao discussed the Darfur crisis with Sudanese President Omar al-Bashir during President Hu's visit to Sudan in January 2007.¹⁶⁶ And in May 2007 China appointed a special envoy to Sudan to convey its desires for the conflict there to be resolved responsibly, and publicly encouraged the government in Khartoum to accept U.N. and African Union peacekeepers. In October 2007 the government announced that the People's Liberation Army (PLA) was preparing to send a combat engineer battalion of 315 soldiers to provide engineering support to the U.N. peacekeeping mission in Darfur.¹⁶⁷

China, however, has not been willing to risk its investment in Sudan in order to increase pressure on the Sudanese government to halt the genocide. It even has increased its aid for infrastructure projects in Sudan. For example, during the same visit in January 2007, President Hu offered an interest-free loan to Khartoum to build a new presidential palace. He cancelled \$80 million of debt, and announced a plan to invest in the construction of a new railroad.¹⁶⁸ China also has invested an estimated \$2 billion in the construction of the Merowe Dam, which is expected to supply all of Sudan's energy needs.¹⁶⁹ Further, China has continued to sell arms to the Khartoum government.

China's "hands off" approach to these nations rests ostensibly on its objections to interference in the internal affairs of one nation by another. It is likely that China's actions also are motivated by a desire to protect its investments and access to energy in those nations, as well as build relationships there. Whatever its explanation or motivation, China at best has failed to help resolve these matters in a manner acceptable to the world community, and at worst has acted as an "enabler" to the abusive regimes in these nations while stymieing or at least complicating international efforts to resolve the political conflicts, humanitarian crises, and rights violations occurring there.

Mr. Herberg testified that there are signs that China is changing its approach, although it is premature to conclude that has occurred. The influence of public awareness campaigns that encour-

age the Chinese government to divest itself of its investments in Sudan, and have linked this issue to the 2008 Olympics in Beijing, has created a policy conundrum for China.¹⁷⁰ China's passive approach to addressing its activities in Sudan and their implications could have an economic impact. In May 2007 Fidelity Investments reduced its stake by 91 percent in PetroChina Co., CNPC's listed subsidiary on the New York Stock Exchange. (CNPC is the Chinese oil company with investments in Sudan.)¹⁷¹ China's passive approach to this issue also is affecting the way in which China is perceived around the globe.

China must balance its desire to maintain its investments in Sudan's oil production, one of its largest overseas sources of equity oil, with its desire to be perceived as a responsible international power that at the very least condemns genocide. Although witnesses testified to the Commission that China most likely will not divest its holdings in Sudan, they expressed the belief it will become more active in urging Khartoum to pursue a more reasonable course and to obtain a resolution to the violence in Darfur.¹⁷² As noted above, China has taken a few, limited steps that suggest this view is correct.

Global Security Implications

Three primary concerns dominate discussions about the strategic consequences of China's energy consumption, and all three relate to China's access to and consumption of oil. First, China's strategy of acquiring equity oil overseas is an attempt to lock up supplies that, in a time of crisis, could significantly affect the global oil market and, subsequently, the United States' ability to acquire oil. Second, China increasingly is willing to expend political capital through its foreign relations and commercial relationships to protect its access to energy supplies. And third, China has expressed and demonstrated willingness to designate military resources to ensure that the transit to China of oil it has produced or obtained in other nations is protected.

The Role of Energy Security in China's Naval Modernization

China has openly expressed the intention to protect its investments abroad, especially its energy supplies. In December 2006, when meeting with representatives of the PLA Navy at the Chinese Communist Party's national congress, President Hu called for a navy capable of defending China's maritime interests and rights.¹⁷³ In July 2007, Commander of the PLA Navy Wu Shengli and then-Political Commissar of the Navy Hu Yanlin, wrote:

Our nation is an oceanic nation that owns more than 18,000 kilometer[s] of oceanic coastline, more than 6,500 islands that are larger than 500 square meters, more than three million square kilometers of oceanic area with sovereignty and jurisdiction, and international exclusive exploitation right for 75,000 square kilometers at the bottom of the Pacific. In the oceanic area of our nation, there exist huge strategic interests along with various contradictions and threats. ... In order to ... maintain the safety of oceanic transportation and the strategic passageway for energy

*and resources, ensure the jurisdiction of our nation to neighboring areas, continental shelf, and exclusive economic zones, and effectively safeguard our national maritime rights, we must build a powerful navy.*¹⁷⁴

PLA military officers at the Academy of Military Sciences reaffirmed this perspective during discussions with the Commission's delegation to Beijing in April 2007.

Because the majority of China's oil imports transits through the Malacca Strait, Beijing views protection of the sea lines of communication (SLOCs) through this area as a priority for its energy security. Dr. James Holmes, Associate Professor at the Naval War College, testified to the Commission:

*From the perspective of international strategy, the Strait of Malacca is without question a crucial sea route. . . . It is no exaggeration to say that whoever controls the Strait of Malacca will also have a stranglehold on the energy route of China. Excessive reliance on this strait has brought an important potential threat to China's energy security.*¹⁷⁵

Currently, the United States is the primary guarantor of the sea lines in the Strait of Malacca. In this respect, Dr. Holmes noted that "China is increasingly reluctant to entrust the security of shipping and thus its economic development to what it sees as the uncertain goodwill of the United States."¹⁷⁶

China does not have the naval capability to assume responsibility for protecting its SLOCs through the Malacca Strait or, were it to see a need to do so, to challenge the U.S. naval presence in that area.¹⁷⁷ This relative weakness is the motivation for a range of steps China is taking to increase its military and nonmilitary options and to decrease its dependence on the Strait.

Dr. Holmes stated in his testimony that in addition to preparing for a possible conflict over Taiwan, resource security is a primary motivation for China's naval modernization. He cited Chinese scholars Liu Xinhua and Qi Yi, who wrote, "Ocean power has permanent meaning to the trade of coastal countries, and the backup of a country's ocean power is its navy. Therefore, the long term approach toward ensuring [open] sea lanes and [access to] potential ocean resources is to [develop] a modern ocean-going navy."¹⁷⁸ As discussed in Chapter 2, Section 1 on China's military modernization, over the long term it appears China may be moving beyond a concentration on developing littoral naval forces and may be beginning to build a blue-water navy that can engage in long-range missions and power projection.

DoD's 2007 *Annual Report to Congress on the Military Power of the People's Republic of China* reports that China's concern about this strategic weakness has prompted Beijing to pursue capabilities that "would help it ensure the safe passage of resources through international waterways."¹⁷⁹ Mr. Helvey noted several related military developments in his testimony, including:

1. *New missile units outfitted with conventional theater-range missiles at various locations in China could be used for anti-access/area denial in a variety of regional contingencies.*

2. *Airborne early warning and control and aerial-refueling programs could permit extended-range offensive air operations into the South China Sea.*
3. *Advanced destroyers and submarines equipped for anti-air, anti-surface, and undersea warfare could enable Beijing to protect and advance its maritime interests.*
4. *New equipment, better unit-level tactics, and greater coordination of joint operations are improving China's emergent expeditionary forces—at present, three airborne divisions, two amphibious infantry divisions, two marine brigades, about seven special operations groups, and one regimental-sized reconnaissance element in the Second Artillery.*
5. *Investment in command, control, communications, computers, surveillance, intelligence, and reconnaissance (C4ISR) capabilities, including space-based and over-the-horizon sensors, could improve identification, tracking, and targeting of foreign military activities deep into the western Pacific Ocean.*
6. *Extended long-range patrolling into the Indian Ocean is providing increased opportunities for PLA Navy crews to become familiar with the traditional sea lanes upon which their oil is shipped. China has conducted two multi-ship forays into the Indian Ocean this year, including one to participate in a multilateral naval exercise hosted by Pakistan, and the other to call on St. Petersburg, Russia.¹⁸⁰*

Dr. Toshi Yoshihara, Associate Professor of the Naval War College, stated in his testimony that a benchmark for measuring Chinese change or progress in the development of these capabilities is to gauge the ability of China to conduct long-range maritime reconnaissance or replenishment operations.¹⁸¹

How China Applies Soft Power to Aid Its Energy Security Efforts

In the meantime, as these capabilities develop, China faces an “ambition-credibility gap,” as described by Mr. Helvey. To lessen the gap while undergoing military modernization, China is building a reservoir of soft power within Asia. Dr. Yoshihara referred in his testimony to Dr. Joseph Nye’s definition of soft power, which is having “an appealing culture or political institutions [that engender] goodwill elsewhere in the world, helping a state’s political leaders initiate collaborative actions involving other states.”¹⁸² The use of soft power, including aid and investments, allows China to expand its presence and influence throughout Asia through cultural and political collaborations that seek to influence other countries’ perceptions of China and dispel fears about China’s military expansion.

For example, China has been negotiating basing rights along the coastline of South and Southeastern Asia, which has been termed its “string of pearls” strategy. According to Dr. Holmes, this strategy is allowing China to “[lay] the foundations of a strategic maritime infrastructure that would enhance both its economic prospects and its military access to the Indian Ocean.”¹⁸³ This strategy has produced concern among China’s neighbors about its intentions. During the Commission delegation’s visit to India in August 2007,

Commissioners were told that Indian policymakers view the “string of pearls” strategy as an attempt to expand Chinese economic, military, and political influence, while at the same time limit India’s role in the region. (See Chapter 4, Section 2 for elaboration.)

One pearl in the string in which China has invested is construction of the Port of Gwadar in Pakistan. This port is located strategically near the Strait of Hormuz, through which oil shipments leaving the Persian Gulf must transit. In the event the United States blocked China-bound ships from passing through the Malacca Strait, oil from the Persian Gulf or Africa could be offloaded from ships and transported overland from Gwadar to China. Dr. Holmes concluded, “Beijing might find the high price of such an alternative worth paying for assured energy supplies in the face of a U.S.-imposed embargo.”¹⁸⁴ Also, this port could serve as a future launching base for a Chinese presence in the Persian Gulf.¹⁸⁵ Although Dr. Holmes noted in his testimony that the Port of Gwadar is no “trump card” for China—given its geographical vulnerabilities and the capabilities of the U.S. Navy—he said that implementation of the “string of pearls” strategy will help China project power and influence well beyond the East and South China Seas and the Taiwan Strait.

Acquisition of new naval capabilities also may assist China in asserting territorial claims that have energy implications. China claims sovereignty over territory in the East and South China Seas involving areas contested by Japan, Taiwan, Brunei, Indonesia, Malaysia, Philippines, and Vietnam.¹⁸⁶ While these territories are not rich in resources above the surface, experts believe the areas contain significant amounts of oil beneath the ocean floor. This has been a motivating factor in China’s assertion of sovereignty over the disputed areas—which, according to Mr. Helvey, has contributed to regional tensions.¹⁸⁷ Tighter energy supplies and higher oil prices could motivate China to act more aggressively toward these claims. This could prompt other nations in the region to build up their own naval forces. The Malabar naval exercise in September 2007 that included the navies of the United States, India, Japan, Australia, and Singapore is an example of expanded military cooperation in the region. Previously, the exercise included only the United States and India.¹⁸⁸ Continued naval buildup may have the potential to increase regional tensions further. Mr. Helvey noted, however, that all parties involved in territorial disputes in the region currently appear to remain focused on resolving them diplomatically.¹⁸⁹

China is able to emphasize a diplomatic approach toward this situation primarily because it has invested heavily in expanding its soft power influence in Asia. Dr. Yoshihara explained China’s motivations for such behavior:

First, Beijing evidently hopes to allay suspicions in Asian countries wary of its great-power ambitions, forestalling U.S. or Asian opposition to its bid for sea power. Second, by assuaging regional anxieties about China’s rise, Beijing is seeking to foster perceptions that the nation’s return to the nautical area ... is not to be feared but rather embraced.¹⁹⁰

Moreover, Dr. Yoshihara argued that, in conducting this soft power campaign, China is attempting to persuade other Asian nations that its mastery of the seas is preferable to mastery by the United States, the self-appointed guarantor of the Asian sea lanes and [in China's opinion] the heir to the imperialist legacy. Thus, China promotes its naval ambitions by framing its actions in terms of "commerce and discovery" in contrast to the ambitions of the United States, which it implies emanate from Western powers' history of "imperial conquest and exploitation."¹⁹¹ It does this in a variety of ways that seek to increase China's cultural appeal, create favorable perceptions of China's economic development model, and strengthen kinship ties to overseas Chinese in the region.¹⁹²

Nonetheless, many Asian countries remain unconvinced that China's motivations and aspirations in the region are benevolent—or even benign. This opinion was reiterated in meetings the Commission delegation had in New Delhi with Indian security analysts and academics.

China's Efforts to Diversify Its Acquisition of Energy Supplies

Another component of China's energy acquisition and security strategy is establishment of land-based routes for transporting energy supplies from their sources to China. These routes will enable China both to diversify its energy supply sources throughout Central Asia and also to import energy via a route that does not pass through the Malacca Strait. Although these routes could not supply China with all its import needs, they could contribute to China's energy security in the event that the Malacca Strait was blocked.

"China has worked assiduously over the past decade to establish closer energy and diplomatic ties with Russia and the key Central Asian energy-rich states."¹⁹³ China has formally entered a Strategic Energy Alliance with Kazakhstan. China's investment in Kazakhstan currently provides it with 200,000 barrels of oil per day and the plan is to increase delivery up to 400,000 barrels per day in the next few years.¹⁹⁴ China signed an agreement in July 2007 with Turkmenistan for long-term supply of natural gas through a new pipeline that will connect the two nations. The terms of that agreement are unavailable publicly, and the volume of natural gas delivery for which it provides is not yet known.¹⁹⁵

In addition, China has been attempting to improve its relationship with Russia, from which it has been receiving approximately 250,000 barrels per day of crude oil by rail, and with which it has been pursuing construction of pipelines to China—although this effort has not progressed at the pace China had hoped. Mr. Herberg noted in his testimony that the reason for this lag is that the bilateral relationship has been "fraught with cross-currents of competition, suspicion, and Russian energy policy paralysis. . . ." ¹⁹⁶ Regardless, he concluded that over the long term it is likely that the volume of oil and gas exports from Russia to China will increase.¹⁹⁷

In Central Asia, China's diplomacy, including its establishment of and involvement in the Shanghai Cooperation Organization (SCO), is key to implementation of its energy policy. Given the cost and difficulty of constructing an oil pipeline, an oil-producing na-

tion must have a secure contract to make such construction financially justifiable. Establishing strong bilateral and multilateral relations is a prerequisite to engendering trust that China will be a long-term customer for oil and gas in this region. Furthermore, establishing these economic interests with its neighbors to the west necessitates protection of those assets if they become threatened. The multilateral military exercises conducted by the SCO,¹⁹⁸ as well as the PLA deployment exercises in China's western Xinjiang province,¹⁹⁹ imply that China could employ military force to protect its energy assets in Central Asia.

An Emergency Oil Supply

While building up its military power and expanding its soft power influence, China also is taking steps to respond to future supply disruptions by establishing national petroleum reserves. During the period of the 10th Five-Year Plan (2001–2005), the Chinese government decided to establish a strategic petroleum reserve (SPR) and identified four sites for storage: Zhenhai, Dalian, Zhoushan, and Huangdao. By 2008, the first phase will be completed and China will have reserves equal to 25 days of net oil imports.²⁰⁰ By the completion of the second phase, China will have reserves equal to 42 days of net oil imports, or 200 million barrels.²⁰¹ When completed, these two facilities combined will have a capacity of 390 million barrels.²⁰² In March 2007 China announced that it may build a fifth storage tank in Lanzhou to hold crude oil imported from Kazakhstan.²⁰³ China already has stored more than 37 million barrels in the Zhenhai tanks.²⁰⁴ The Zhoushan storage terminal on the Aoshan Islands in Zhejiang province began accepting deliveries of crude in May 2007.²⁰⁵

Dr. Erica Downs of the Brookings Institution noted in a monograph on China's energy security that as of the end of 2006, China has not delineated its policies for using its strategic reserves.²⁰⁶ Management of the SPR falls under the State Oil Stockpiling Office and State Oil Stockpiling Center that are subordinate to the National Reform and Development Commission, but the nature of this bureaucracy and its relation to the operation of the SPR is unclear.²⁰⁷ Furthermore, it has been reported that the government increasingly is involving some of its major oil companies in the SPR activities and operations. For example, CNPC and Sinopec have been put in charge of constructing the SPR sites,²⁰⁸ and *The Economist* reports that Sinopec has been given control over a third of the storage capacity at the Zhenhai storage facility.²⁰⁹

The lack of transparency in SPR operational policies and the involvement of China's oil companies in their operation have fueled concerns that Beijing may use its stockpiled oil to manipulate international prices. This has caused concern that one of China's considerations in deciding when to release reserves may be maximizing profits for its state-owned energy companies.²¹⁰ It also is possible, however, that the oil companies' involvement is nothing more than the government looking to its national energy companies to provide technical expertise its own bureaucratic organizations may lack.

In the 2006 U.S.-China Energy Policy Dialogue, U.S. officials emphasized the importance to the global petroleum market of using strategic reserves only during severe market disruptions and not to control domestic market prices.²¹¹ Assistant Secretary of Energy for Policy and International Affairs Karen Harbert testified that at a meeting of energy ministers in December 2006, China expressed its intention to use its strategic reserves to ease adjustment to supply disruptions and not as a “market management tool.” Regardless, the U.S. Department of Energy is urging China to make a public commitment to coordinate drawdown of its strategic reserves with other nations and in coordination with the International Energy Agency.²¹²

Implications for the United States

The implications for the United States of China’s strategy for energy security are multifaceted. First, China relies on the United States to secure the sea lanes through which its energy supplies are shipped, and does not contribute to this effort. Essentially, China is able to be a free rider—receiving the benefit of U.S. protection of the sea lanes through which its energy supplies transit—while it simultaneously funnels available naval funds into a modernization program to develop a blue-water fleet.

Additionally, China’s allegiance to an oil equity ownership policy runs contrary to the approach of industrialized nations that rely on the free market to ensure an efficient distribution of oil supplies, and it reduces the ability of the market to respond quickly to political and natural disruptions in the global oil supply.

The relationships China forms and maintains with oil-producing countries such as Iran and Sudan in order to obtain oil supplies from them do not serve the interests of global peace and security or human rights. Mr. Helvey testified that “[a]n immediate consequence of this behavior is the negative impact that this has on U.S. goals favoring the spread of democracy, as well as priorities for the promotion of human rights and the rule of law, confronting the threat of terrorism, and non-proliferation.”²¹³ Oil revenue received from China props up these regimes and thwarts multilateral efforts to get the leaders of these nations to comply with international standards of behavior.²¹⁴

Improvements in the U.S.-China Strategic Energy Relationship

Witnesses testified that China is starting to conclude that its approach to energy security will not provide the level of security Beijing desires.²¹⁵ China knows, of course, that it cannot meet its energy needs through domestic supplies of coal, natural gas, and oil, and thus must import energy sources. China’s equity petroleum assets abroad currently are sufficient to supply only a very small portion of its overall demand for imports, and China will not be able to meet its needs through this strategy alone.²¹⁶

Mr. Herberg noted that China is beginning to see the pragmatic appeal of a multilateral approach to energy security, and to change its strategy for pursuing energy security. He also told the Commission that China’s demand is rising too quickly to be addressed effectively through equity investments, and that policy advisors in

Beijing are starting to suggest that the government instead focus on the stability of the market. Additionally, he testified that:

[T]here is a growing sense in Beijing that the investment interests of China's [national oil companies, or] NOCs in expanding abroad are not necessarily synonymous with China's national energy security interests. . . . There is growing discussion that, while China should have strong, globally competitive national oil companies commensurate with other global powers, China's energy security interests do not require heavy state support or unnecessarily controversial financial and diplomatic support for [its] NOCs.²¹⁷

Moreover, he noted that China is beginning to focus on the patterns of its domestic energy consumption and promote energy conservation, energy efficiency, and demand-side reforms that open the door to international cooperation.²¹⁸

This change could affect the U.S.-China strategic energy relationship because it allows the relationship to be predicated upon mutual interests such as sea lane security, global oil market stability, and climate change. To this end, Assistant Secretary Harbert testified, "As two major energy consumers and economies in the world, the United States and China have been cooperating to address energy security and climate change issues. . . . Over the course of recent years, the two countries have come to recognize how interdependent our economic prosperities and energy security have become."²¹⁹ Deputy Assistant Secretary of Energy for International Energy Cooperation David Pumphrey further noted, "This is a process that we take one step at a time, and based upon the progress we have achieved thus far, I believe there are even greater benefits down this road for both nations in terms of energy security and a clean energy future."²²⁰

Conclusions

- China's pursuit of equity oil acquisitions is contrary to international commercial practices related to energy that support use of the market, and allocation of available petroleum supplies through international cooperation in the event of an emergency.
- In pursuing some of its global energy interests, China aids regimes operating contrary to U.S. foreign policy interests, such as the genocidal government in Sudan and Iran's government that is attempting to develop its own nuclear capability.
- The bilateral relationships China is building around the world—many if not most of them largely motivated by its quest for energy supplies and other resources—have resulted in an increase of its global economic, political, diplomatic, and cultural influence that has the potential to challenge U.S. interests.
- China's naval modernization is targeted not only on a Taiwan scenario but also on protecting China's economic resource supply chains. As Chinese overseas investment grows, the government will have a greater stake in protecting these investments and the ability to transport to China the resources the investments are producing and its economy requires. This is a major determinant of China's naval modernization.

SECTION 4: PROSPECTS FOR ADDRESSING THE EFFECTS OF CHINA'S ENERGY CONSUMPTION

“The Commission shall investigate and report on—

“ENERGY—The effect of the large and growing economy of the People’s Republic of China on world energy supplies and the role the United States can play (including joint research and development efforts and technological assistance), in influencing the energy policy of the People’s Republic of China.

“UNITED STATES-CHINA BILATERAL PROGRAMS—Science and technology programs, the degree of non-compliance by the People’s Republic of China with agreements between the United States and the People’s Republic of China on prison labor imports and intellectual property rights, and United States enforcement policies with respect to such agreements.”

Energy Policymaking Reform

In May 2007 a study by the McKinsey Global Institute concluded, “Developing countries could contribute more to improving energy productivity, largely because they tend to start at a lower base than developed economies. Their faster growth also creates opportunities to adopt the latest, energy-efficiency technologies in a cost effective way. The choices they make will therefore be critical to the future trajectory of energy demand growth. China, as in so many other respects, will be crucial because of its size and rapidly growing weight in the world economy.”²²¹ The environmental consequences and strategic effects of China’s energy consumption will have dramatic consequences for China and the world. For this reason it is very important to encourage China to find options that limit demand, and allow China to improve its energy security and environmental quality. Successfully addressing this issue will be crucial not only for the continued health of the Chinese economy but also, given the nature of the globalized economy, for the continued health of the American economy.

To succeed in increasing energy efficiency and conservation, and in adopting cleaner energy technologies, China will need to address the structural weaknesses within its energy policymaking and enforcement apparatus and establish policies that provide economic incentives for choosing cleaner energy alternatives.

U.S. Environmental Protection Agency (EPA) Assistant Administrator for International Affairs Judith Ayres testified to the Commission that “... the heart of a successful regulatory regime is compliance and enforcement. ...”²²² Yet, as mentioned in Chapter 3,

Section 1, China's energy policy structure places responsibility for implementing most energy use policies on local and provincial governments. This decentralization results in a potpourri of approaches rather than a cohesive national policy intended to curb emissions and improve energy efficiency. For example, Ms. Barbara Finamore, Senior Attorney and Director of the China Clean Energy Program at the Natural Resources Defense Council, testified that the 11th Five-Year Plan (2006–2010) calls for the implementation of building efficiency standards that require energy savings of 50 percent for new buildings and 65 percent for buildings in Beijing, Shanghai, Tianjin, and Chongqing. However, only 10 percent of newly constructed commercial buildings and 15 percent of new residential buildings are in compliance.²²³

Assistant Secretary of Energy for Policy and International Affairs Karen Harbert noted in her testimony that the solution to this failure is not “upping the mandate,” but rather is clearly delineating responsibilities and providing policy tools that enable officials to implement the law.²²⁴ Mr. Saad Rahim of PFC Energy testified that China currently has an opportunity to put a new framework in place to resolve the existing system's problems, but if China delays, then the political, economic, and environmental costs associated with its existing energy consumption will rise exponentially.²²⁵

China's State Environmental Protection Administration (SEPA) recognizes this situation and has taken a crucial step to strengthen its capability to prescribe and enforce regulations pertaining to energy use by creating six regional offices. Typically, provincial and local governments in China establish agency structures mirroring the structure of the central government, but the provincial and local agencies do not coordinate directly with the central government counterpart agencies.²²⁶ Also, funding for provincial and local government agencies usually is collected at the local level, establishing a strong incentive for local officials to be responsive to local interests. However, in SEPA's initiative, its regional offices will report directly to it and will not be subservient to local economic interests. SEPA hopes this structure will increase its ability to monitor air pollution and enforce air quality regulations.²²⁷ Importantly, SEPA has sought assistance from the Asian Development Bank and the U.S. Environmental Protection Agency in developing this new regional system and in engaging stakeholders outside the national government.²²⁸ Seeking structural examples from other nations in the process of determining how China will address its internal challenges is a positive step, and offers a reason to be hopeful that China's government also will be willing to engage cooperatively with the United States and other nations to address environmental challenges and to share environmental data.

Along these lines, the Chinese government's recent decision to refuse to release two reports quantifying the impact of air pollution on public health and the cost of China's pollution on its gross domestic product (GDP) is not a fortuitous indicator.²²⁹ Without public information detailing the costs of pollution to China and the Chinese people, it will be more difficult for the government to take the steps necessary to reduce pollution, establish monitoring base-

lines, and motivate the public to participate in energy conservation and environmental awareness efforts.

Assistant Secretary Harbert noted in her testimony that, with an increasingly market-oriented economy, China now is starting to realize that it must incentivize action, rather than mandate it.²³⁰ Policies can provide either positive incentives (to encourage a certain behavior) or negative incentives (to discourage a behavior). For example, pursuing a policy of demand-side management would provide a positive incentive because it would promote consumer conservation of energy by internalizing the costs of energy efficient technologies in power production. Essentially, investment in energy efficient technology by power producers and government administrators would result in “avoided demand.”²³¹ China has tested this policy in Jiangsu Province, and has adopted Jiangsu’s program as a national model for other provinces.²³²

Following a large benzene spill in the Songhua River in Heilongjiang Province in 2005, China passed regulations that criminalized failure to report the spill of dangerous pollutants.²³³ Attaching criminal penalties to the reporting requirement is an example of a negative incentive—in this case applied to local officials.

To assist it in bringing energy and environmental problems to the public sphere, and thereby enhancing its enforcement capability, SEPA has been encouraging nongovernmental organizations (NGOs) to investigate and report local environmental problems. Dr. Jennifer Turner of the China Environment Forum at the Woodrow Wilson International Center for Scholars testified, “Chinese environmental NGOs have begun to take on more sensitive issues such as [conducting] a national campaign to demand more transparency in dam-building decision-making and assisting pollution victims in class action court cases.”²³⁴ Essentially, SEPA is beginning to employ NGOs to help extend the reach of the central government’s enforcement capability for environmental laws and regulations to the provincial and local levels.

Stimulating Commercial Investment in Clean Energy Technology

Altering the existing financial incentives pertaining to pollution so that Chinese firms perceive negative economic costs tied to industrial pollution, and see pollution prevention as being in their self-interest, will be key to achieving pollution reduction objectives. Mr. Wayne Rogers, a Partner at Sonnenschein, Nath & Rosenthal, testified, “China recognizes that there are technology choices to protect the environment and to reduce atmospheric pollution; however, these are perceived as ‘costs,’ not ‘benefits.’”²³⁵ Reframing the private sector’s perception of costs and benefits in the market will be crucial to persuading businesses to invest in the application of cleaner technologies.

In his testimony to the Commission, Dr. Mun S. Ho, a Visiting Scholar at Resources for the Future, suggested one means of altering market forces to favor reducing pollution: establishing a “green tax.”

Pollution is a “negative externality,” i.e. the factory owner does not bear the cost of the health and material damages

*[of pollution] . . . A pollution tax [or “green tax”] would “internalize” this externality, if producers are charged a fee for every ton of SO₂ [sulfur dioxide] they produce: then they would: (a) find ways to reduce SO₂ emissions, (b) raise the price of their output leading consumers to use less of this environmentally-unfriendly good, leading to lower output and lower fuel use. The level of this fee should thus be set in a manner that balances these costs on producers and consumers with the health benefits.*²³⁶

Chinese firms do not have to bear the environmental costs of producing and consuming energy.²³⁷ A green tax, such as a carbon tax,²³⁸ would encourage energy producers to seek energy production methods that produce the least pollution. Given that producers pass on some of their costs to consumers, energy consumers would be encouraged to choose environmentally friendly energy producers. Consumers of manufactured products would have an incentive to choose products from manufacturers whose processes are the most environmentally friendly, because the cost of their products would be lower. This policy would not necessitate a dramatic decline in national output as it promotes a shift toward environmentally sustainable production and energy use.

Foreign direct investment and venture capital also can be instruments to promote and facilitate the use of clean energy sources and technologies. Dr. Kelly Sims Gallagher, Director of Energy Technology Innovation Policy at Harvard University’s Kennedy School of Government, testified that “. . . foreign direct investment can be a highly effective mechanism for the transfer of technology, but technology transfer (especially clean technology transfer) does not happen automatically. . . . There must be incentives in place to elicit clean technology transfer because the private companies do not find it in their interest to develop, transfer, and install cleaner technologies on their own.” Such incentives could include requiring private joint ventures to meet higher standards for pollution controls and to transfer clean energy technologies among the venture partners.²³⁹

Given that China soon will become the world’s largest energy market, venture capital can provide seed funding for development of new energy technologies to meet China’s demand. Expansion of venture capital in China will be challenged by pervasive violation of intellectual property rights, as venture capitalists will be averse to the risk of losing control to pirates of firms’ newly developed technologies.²⁴⁰ Addressing intellectual property enforcement could facilitate the development and distribution of clean energy and energy efficient technologies.

China is one of the world’s largest markets for the Kyoto Protocol’s Clean Development Mechanism that allows companies in industrialized nations to invest in clean energy projects in developing countries in order to meet their Kyoto compliance obligations. China’s involvement in this mechanism brings international companies into the country and “allows the gap to be closed between higher costs of green energy and the market cost of brown energy.”²⁴¹ The United States is not a party to the Kyoto Protocol and thus is not engaged in this initiative. However, witnesses recommended establishing bilateral or multilateral mechanisms to encourage private

sector investment—such as the creation of an investment fund to accelerate adoption of low-carbon technology in China.²⁴²

U.S.-China Cooperation on Energy

Central findings from the Commission's hearings and research this year are that China cannot address its energy and environmental problems adequately without international cooperation, and that the United States, both because it is the world's biggest consumer of energy and because it possesses some of the most advanced energy efficiency and clean energy technologies, should play an active role in providing assistance to China. Assistant Secretary Harbert declared, "It is incumbent upon us to engage much more aggressively with China, to help them understand the benefits of participating in a world market."²⁴³ Dr. Elizabeth Economy of the Council on Foreign Relations warned that "[r]eal cooperation on climate change and energy and the environment is every bit as difficult as that on arms proliferation, market access, or human rights."²⁴⁴ Nonetheless, the costs of failure would be so high to both nations that the United States needs to do all it can do to help China recognize the benefits of implementing energy efficiency and conservation measures, and removing the manmade causes of global climate change.

The U.S. Department of Energy (DOE), the U.S. EPA, and U.S. universities and nongovernmental organizations have been actively pursuing cooperative activities on a number of levels. Deputy Assistant Secretary of Energy David Pumphrey testified, "DOE engages China in energy policy, energy security, fossil energy, energy efficiency, renewable energy, and nuclear energy and nonproliferation. The primary mechanisms include the U.S.-China Energy Policy Dialogue (EPD), technical cooperation under the auspices of the U.S.-China Science and Technology Agreement, the U.S.-China Peaceful Uses of Nuclear Technology Agreement, the Oil and Gas Industry Forum, and the recently established Strategic Economic Dialogue (SED)."²⁴⁵ Another mechanism is the Asia Pacific Partnership for Clean Development and Climate that involves Australia, China, India, Japan, the Republic of Korea, and the United States. These partners "have agreed to work together and with private sector partners to meet goals for energy security, national air pollution reduction, and climate change in ways that promote sustainable economic growth and poverty reduction."²⁴⁶

In addition, the United States has actively engaged China on the development of nuclear energy technology, as was mentioned in Section 1 of this chapter. However, this cooperation has been expanded beyond only the sale of nuclear technology to China—to include cooperation on nuclear security and the expansion of peaceful nuclear energy. In May 2007 at the fourth meeting of the Joint Coordinating Committee of the Peaceful Uses of Nuclear Technology Agreement, the United States and China created a new working group on "nuclear emergency management; a new sub-group on radiological source security in the nuclear security, emergency management, and safety working group; and the inclusion of export control technical cooperation to jointly develop Chinese language nuclear commodity guides to aid in China's export licensing and en-

forcement.”²⁴⁷ Also, China has expressed interest in joining the Global Nuclear Energy Partnership (GNEP) that seeks to expand access to nuclear energy technology for peaceful purposes while reducing the risk of nuclear proliferation. The State Council in China has not finally determined if China will participate.²⁴⁸

The FutureGen project has the greatest potential to curb China’s emissions in ways other than requiring China to reduce its coal consumption. FutureGen Alliance Chief Executive Officer Michael Mudd testified, “The FutureGen Project is a global public-private partnership formed to determine the technical and economic feasibilities of generating electricity from coal with near-zero emissions, including carbon dioxide [CO₂].” FutureGen will cost an estimated \$1.5 billion when estimated revenue offsets are included.²⁴⁹ The U.S. Department of Energy is funding 74 percent of the project, and China, India, and South Korea are co-funding it;²⁵⁰ China is expected to pay \$10 million.²⁵¹ This project is designed to demonstrate the feasibility of constructing and operating a power plant that will rely on an Integrated Gasification Combined Cycle (IGCC) technology, and then capture and sequester carbon dioxide so it will be nearly free of emissions.²⁵²

The China Huaneng Group, one of China’s largest energy companies, is a private partner in the FutureGen Alliance along with some of the United States’ largest power companies. Of note, the Alliance is a non-profit organization and members like Huaneng are not entitled to receive financial gain or intellectual property associated with the FutureGen project.²⁵³ Given the extent of China’s coal-related environmental problems, successful development of FutureGen that enables application of this technology to power production elsewhere in China should be warmly welcomed by Beijing.

The U.S. EPA has engaged China in “agency-to-Ministry agreements, multilateral efforts such as the Asian Pacific Partnership on Clean Development and Climate,” and SED discussions.²⁵⁴ Assistant Administrator Ayres testified that many of the EPA’s programs are conducted within the framework of a 2003 Memorandum of Understanding with SEPA that allows the two agencies to coordinate activities. Current projects include working with SEPA and Beijing’s EPA to retrofit diesel buses in Beijing with emissions control equipment in advance of the 2008 Olympic Games, and working in rural areas to decrease indoor air pollution by providing alternative home heating and cooking energy sources.²⁵⁵

The EPA’s Integrated Environmental Strategies Program (IES) was identified in testimony before the Commission as a very successful program for U.S.-China cooperation.²⁵⁶ The IES Program seeks to reduce greenhouse gases on a global level and air pollution on a local level through the implementation of integrated policies and measures. The EPA’s China program, initiated in 1999, is composed of three parts: “(1) assessment of energy options and health benefits in Shanghai; (2) analysis of energy and transport programs in Beijing; and (3) a national assessment of GHG [greenhouse gases] mitigation potential and expected health benefits of several air pollution control policies.”²⁵⁷ One of the outcomes of this collaboration is that Shanghai changed its 10th Five-Year Plan (2001–2005) to focus more on energy and investment in cleaner energy alternatives for the city.²⁵⁸

The EPA also has engaged China in the work of the multilateral Methane to Markets Partnership that seeks to promote “cost-effective, near-term methane recovery and use as a clean energy source.”²⁵⁹ As China is the world’s largest emitter of coal mine methane, its participation in this effort has significant implications for reducing greenhouse gas emissions. Also, China will host the Methane to Markets Expo in 2007 to showcase the partnership.

In addition to activities directly sponsored and implemented by the U.S. government, U.S. universities and NGOs have actively pursued cooperation with China on energy and environmental issues, often with government funding. Two university projects—the U.S./China Energy and Environmental Technology Center (EETC) at Tulane University and the China Environmental Health Project at Western Kentucky University—were examined by the Commission in its hearings.

The EETC works with U.S. government agencies to expand the collaboration and transfer of clean energy technologies, and has centers in the United States at Tulane and in China at Tsinghua University. According to EETC Director Dr. S.T. Hsieh, “[t]he center’s major goal is to enhance the competitiveness and adoption of U.S. clean energy and environment technology, especially clean coal technology for power generation, transmission, and emissions reductions supported by DOE [the Department of Energy].”²⁶⁰ The EETC seeks to accomplish this by enhancing U.S. industry partnerships in China that focus on small- and medium-sized businesses; through involvement of public and private stakeholders; and through industry education and training in China addressing the financial and technical aspects of employing new technology.²⁶¹ In practical terms, EETC’s projects benefit U.S. businesses by increasing U.S. technology exports—as a function of promoting the transfer of coal gasification technology, coal liquefaction technology, and flue gas desulfurization technology to Chinese companies and organizations. The EETC currently is pursuing projects on nitrogen oxide emissions reduction; retrofitting small industrial boilers in Beijing to make them more efficient; carbon capture and sequestration; and capturing coal mine methane and coal bed methane and supplying it to local townships.²⁶² All these projects fulfill goals for cooperation identified by the U.S. DOE. They also involve U.S. businesses by matching American technology with energy-related opportunities in China.

At Western Kentucky University, Dr. Wei-Ping Pan leads the clean coal technology component of the China Environmental Health Program, funded by the U.S. Agency for International Development. In this program, Dr. Pan cooperates with Anhui University of Science and Technology in Huainan City. This city has a strong interest in the project because it has coal reserves of 44.4 billion tons or 19 percent of China’s total national reserves. The China Environmental Health Program seeks to improve air quality monitoring and control in Huainan City; to train Chinese researchers in the latest environmental protection technologies; and to assist Anhui University researchers in studying the impact of coal emissions on community health.²⁶³ This project combines data collection with environmental impact studies and meets two crucial needs within China: first, compiling accurate emissions data and

information at a local level about how applied technology can reduce emissions; and second, collecting accurate information on how coal emissions are affecting local health and productivity.

Prospects for Future Cooperation

Based upon an analytical review of the testimony before the Commission, three important aspects of U.S.-China energy cooperation emerge. First, Administration witnesses noted that frequent high-level ministerial dialogue on energy and the environment is important for raising consciousness on these issues, demonstrating government commitment to resolving energy security and environmental concerns, and establishing the matters addressed as priorities for the subordinate bureaucracies that must carry out the programs' activities. Assistant Secretary Harbert testified that the Department of Energy has conducted ten senior-level visits to China in the past two years. This interaction signals that energy security and energy cooperation are high priorities for the United States, and that the United States prefers to resolve mutual concerns through cooperation rather than conflict.

The Strategic Economic Dialogue (SED) has been an important mechanism for demonstrating high-level interest in various issues including energy and environmental matters, and for cooperatively addressing mutual concerns. Although the general impression is that the SED has not produced significant accomplishments, it has provided a forum in which both the United States and China have expressed like-minded ideas about a number of energy and related issues. During the December 2006 meeting of the SED, Secretary of Energy Samuel W. Bodman and NDRC Chairman Ma Kai signed the U.S.-China Energy Efficiency and Renewable Energy Protocol. This agreement builds on prior initiatives to advance the use of renewable energy technologies in China and the commercialization of solar, wind, biomass, geothermal, and hydrogen energy.²⁶⁴ At the SED in May 2007, "Secretary Bodman led discussions on the urgency for investment in the energy sector, the importance of a diversified energy mix, and the power of scientific innovation in addressing climate change issues"—all issues on which China and the United States have similar views. Both countries agreed to develop up to 15 large-scale coal mine methane projects in China, agreed to reduce cost barriers to the full commercialization of advanced coal technologies, and signed a Memorandum of Cooperation on Nuclear Security.²⁶⁵

Assistant Administrator Ayres noted that during the SED the U.S. EPA and China agreed to conduct a Joint Economic Study to evaluate the environmental, economic, and health costs of policy approaches for saving energy and controlling emissions. The two nations also agreed to explore harmonizing the U.S. program for energy efficiency labeling for consumer products with China's Standard Certification Center (CSC) to improve the energy efficiency of Chinese products and reduce energy intensity.²⁶⁶

The second aspect of U.S.-China energy cooperation brought out in testimony to the Commission is that addressing China's coal consumption will be necessary in order to address U.S. and Chinese energy security and environmental pollution. Without strong

intervention by Beijing, China's dependence on coal likely will not diminish, even as the environmental costs grow. The quantities of pollutants emitted from China's coal combustion affect other portions of the world including the United States, and, of course, the entire planet is subject to the climate change to which China's greenhouse gas emissions now are a major and growing contributor.

As long as coal remains a major energy source for China, development and commercialization of carbon capture and sequestration (CCS) technology will be critically important. Before such technology can be commercially viable, large-scale underground pilot tests must be conducted and the cost of obtaining carbon to conduct such tests must be reduced substantially.²⁶⁷ Witnesses before the Commission suggested that the U.S. government should support these demonstration projects—both within the United States and in China—and the development of a viable business model for employing this technology.²⁶⁸ Before CCS can be implemented on a large scale, sites in China that are geologically and geographically suited to be reservoirs must be identified.²⁶⁹ Ultimately, the technology must be applied both to new power plants that will be constructed and to existing plants that must be retrofitted to capture carbon—an expensive proposition.²⁷⁰ While the former in most cases will be less expensive, the number and emissions volume of existing plants makes the latter essential, despite the high cost, in any scheme intended to achieve major reductions in China's carbon emissions. Already China is collaborating with other Asia Pacific Partnership nations on CCS under that Partnership's auspices, but Dr. Jeffrey Logan, Senior Associate at the World Resources Institute, argued that the United States should strongly encourage and further assist China to pursue a broader and more aggressive effort.²⁷¹

Finally, witnesses testified that U.S.-China cooperation on energy and the environment should be predicated on U.S. leadership and action on these issues to address U.S. domestic energy and climate concerns. Dr. Logan made the following case:

*The most important thing the U.S. can do to mitigate the impacts of China's recent enormous growth in energy demand is to lead by example. The U.S. must demonstrate that it can address energy security and climate change simultaneously within a thriving economic context. . . . Without this leadership, no incremental shift in technical assistance or policy dialogue will get the traction it needs to help move China onto a fundamentally different course.*²⁷²

His testimony, echoed in statements by Governor Brian Schweitzer of Montana, argued that the United States has the ability to encourage and affect change in China's energy strategy and consumption patterns by demonstrating the feasibility of energy conservation and energy efficiency in the United States, moving substantially toward energy independence, and significantly reducing U.S.-generated carbon dioxide emissions. Such steps can yield new ideas, techniques, policies, and technologies that the United States can share with China, and identify new stakeholders to involve in addressing global climate change.²⁷³

Conclusions

- Success in addressing China's energy challenges will require the Chinese government to focus on correcting the structural weaknesses within its energy policymaking apparatus.
- Cooperative projects that promote and support the collection and reporting of sufficiently detailed energy and environmental data will contribute substantially to China's ability to address challenges in these fields and to the ability of the United States and other nations to provide real encouragement and targeted assistance to those efforts.
- U.S.-China cooperation on energy and the environment is a crucial component for addressing the energy challenges that both countries face.
- China presents an opportunity to develop and apply U.S. energy technologies on a large commercial scale that will increase the viability of these technologies on the market.

RECOMMENDATIONS

China's Energy Policy, Demand, and Supply

- The Commission recommends that Congress encourage the Administration to seek greater cooperation with China in collecting and reporting energy-related data and to assist China to improve the bureaucratic framework and governance of its energy policy-making bodies.
- The Commission recommends that Congress urge the Administration to engage China to address global climate change/environmental degradation and identify opportunities for further U.S.-China cooperation.

China's Environmental Situation

- The Commission recommends that Congress urge the Administration to increase its monitoring of air quality in the western United States and its support for efforts to determine the pollution in the United States that can be traced to China.
- The Commission recommends that Congress encourage the Administration to seek opportunities with China for (1) joint study of the economic and social costs of environmental pollution, (2) joint projects to monitor more effectively and transparently relevant environmental pollutants, and (3) joint projects to prevent pollution by use of nonpolluting energy sources and technologies and application of technologies to reduce pollution from carbon fuel combustion (such as carbon capture and sequestration techniques).

The Geostategic Impact of China's Energy Policies and Activities

- The Commission recommends that Congress urge the Administration to engage in a dialogue with China and other Asian nations about the physical security of their energy supplies, protection of sea lines of communication, and energy cooperation in Asia.
- The Commission recommends that Congress urge the Administration to set as an objective for the next Strategic Economic Dialogue session developing with China a concrete agenda, a set of principles, and a timetable for identifying and addressing common strategic energy concerns.

Prospects for Addressing the Effects of China's Energy Consumption

- The Commission recommends that Congress encourage the Administration to continue its current energy cooperation with China and seek opportunities to expand that cooperation at all levels of engagement, especially directed toward enhancing the monitoring and enforcement capabilities of China's energy and environmental regulatory agencies.
- The Commission recommends that Congress encourage the sale to China of U.S. energy efficiency and clean energy technologies, especially from small- and medium-sized enterprises, and the implementation of those technologies in China.
- The Commission recommends that Congress urge the Administration to seek further opportunities for the U.S. Environmental Protection Agency to cooperate with China on the development and enforcement of energy efficient building codes to promote energy conservation and energy efficiency in new building construction.

ENDNOTES FOR CHAPTER 3

1. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikkal Herberg, June 14, 2007.
2. "New Ministry Recommended to Handle Energy Challenges," *China Daily*, June 2, 2006. www.chinadaily.com.cn/china/2006-06/02/content_606838.htm.
3. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies Washington, DC: April 2007), p. 19.
4. Erica Downs, "The Brookings Foreign Policy Studies Energy Security Series: China," (The Brookings Institution, Washington, DC: December 2006), pp. 19-21.
5. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 18.
6. Erica Downs, "The Brookings Foreign Policy Studies Energy Security Series: China," (The Brookings Institution, Washington, DC: December 2006), p. 23.
7. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Lee Schipper, June 14, 2007.
8. Erica Downs, "The Brookings Foreign Policy Studies Energy Security Series: China," (The Brookings Institution, Washington, DC: December 2006), p. 24.
9. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of David Helvey, June 15, 2007.
10. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
11. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
12. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
13. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
14. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
15. "China vows to take due responsibility to curb global warming," *Xinhua*, March 6, 2007.
16. "China 2006 energy consumption per unit of GDP down 1.33 pct yr-on-yr-UPDATE," *Forbes.com*, July 12, 2007. www.forbes.com/afxnewslimited/feeds/afx/2007/07/12/afx3906507.html. This figure of 1.33 percent was revised from an earlier government estimate of 1.23 percent.
17. China's National Climate Change Programme, Prepared under the Auspices of the National Development and Reform Commission, People's Republic of China, June 2007. pp. 26-29.
18. "Need for an energy law overseer, says drafter," *Xinhua*, April 28, 2007.
19. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
20. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
21. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
22. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
23. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.

24. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
25. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
26. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
27. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
28. EMBARQ is an acronym for the Center for Transport and the Environment at the World Resources Institute. This program seeks to diagnose urban transport problems and provide environmentally sustainable solutions.
29. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Lee Schipper, June 14, 2007.
30. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
31. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
32. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.
33. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
34. *The Future of Coal: Options for a Carbon-Constrained World*, (Massachusetts Institute of Technology, Cambridge, MA: 2007), p. 63.
35. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
36. Elaine Kurtenbach, "China to control coal production," *BusinessWeek.com*, January 23, 2007.
37. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Tuner, June 14, 2007.
38. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
39. *The Future of Coal: Options for a Carbon-Constrained World*, (Massachusetts Institute of Technology, Cambridge, MA: 2007), p. 63.
40. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
41. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
42. Anne Chaon, "Old king coal hard to dethrone," *Agence France-Presse*, May 3, 2007. www.energy-daily.com/reports/Old_King_Coal_Hard_To_Dethrone_999.html.
43. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
44. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
45. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007; Richard McGregor, "Coal imports become China's burning issue," *Financial Times*, April 24, 2007.
46. U.S. Energy Information Administration, "China: Oil." www.eia.doe.gov/emeu/cabs/China/Oil.html.

47. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.
48. U.S. Department of Energy, Energy Information Administration, *Annual Energy Outlook 2007 with Projections to 2030*, (U.S. Department of Energy, Washington, DC: 2007), p. 8.
49. U.S. Energy Information Administration, "China: Oil" www.eia.doe.gov/emeu/cabs/China/Oil.html.
50. Wu Zhong, "China's oilfield of dreams," *Asia Times*, May 16, 2007.
51. "Saudi to return as China's top oil supplier—Aramco," *Reuters*, September 6, 2006.
52. Eurasia Group, *China's Overseas Investments in Oil and Gas Production*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, October 16, 2006, p. 21.
53. Erica Downs, "The Brookings Foreign Policy Studies Energy Security Series: China," (The Brookings Institution, Washington, DC: December 2006), p. 10.
54. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of David Helvey, June 15, 2007.
55. Erica Downs, "The Brookings Foreign Policy Studies Energy Security Series: China," (The Brookings Institution, Washington, DC: December 2006), p. 43.
56. Eurasia Group, *China's Overseas Investments in Oil and Gas Production*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, October 16, 2006, p. 5.
57. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
58. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 43.
59. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
60. Eurasia Group, *China's Overseas Investments in Oil and Gas Production*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, October 16, 2006, p. 12.
61. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
62. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
63. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 33; Erica Downs, "The Brookings Foreign Policy Studies Energy Security Series: China," (The Brookings Institution, Washington, DC: December 2006), p. 43.
64. Erica Downs, "The Brookings Foreign Policy Studies Energy Security Series: China," (The Brookings Institution, Washington, DC: December 2006), p. 43.
65. Eurasia Group, *China's Overseas Investments in Oil and Gas Production*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, October 16, 2006, p. 21.
66. Eurasia Group, *China's Overseas Investments in Oil and Gas Production*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, October 16, 2006, p. 15.
67. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikal Herberg, June 14, 2007.
68. Shai Oster, "China CNPC Buys Exploration Rights To Canada Oil Sands," *Wall Street Journal*, June 29, 2007. www.uofaweb.ualberta.ca/chinainstitute/nav03.cfm?nav03=62230&nav02=57351&nav01=57272.
69. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 22.

70. "China cuts refined oil prices," *Xinhua*, January 13, 2007. [www/china-daily.com.cn/china/2007-01/14/content_782877](http://www.china-daily.com.cn/china/2007-01/14/content_782877).
71. Yee Kai Ping, "China Issues New Rules to Open Energy Sector to Foreign Companies," *Wall Street Journal*, December 6, 2006.
72. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 21; "New gas terminal will aid clean-energy effort," *Shanghai Daily*, January 23, 2007. www.shanghaidaily.com/article/?id=303783.
73. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.
74. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 21; "New gas terminal will aid clean-energy effort," *Shanghai Daily*, January 23, 2007. www.shanghaidaily.com/article/?id=303783.
75. "New gas terminal will aid clean-energy effort," *Shanghai Daily*, January 23, 2007. www.shanghaidaily.com/article/?id=303783.
76. "China to regulate natural gas imports from June 10," *Xinhua*, May 29, 2007. www.uofaweb.ualberta.ca/chinainstitute/nav03.cfm?nav03=60807&nav02=57488&nav01=57272; "Gas import ruling not related to global trends," *People's Daily*, June 15, 2007. english.peoplesdaily.com.cn/200706/15/eng20070615_S84519.html.
77. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 23.
78. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 23.
79. Erica Downs, "The Brookings Foreign Policy Studies Energy Security Series: China," (The Brookings Institution, Washington, DC: December 2006), p. 11.
80. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
81. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
82. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.
83. U.S. Department of Energy, Energy Information Administration, "Future of the Chinese Nuclear Industry," www.eia.doe.gov/cneaf/nuclear/page/nuc_reactors/china/outlook.html; Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 18; David J. Lynch, "Nuclear industry hopes to capitalize on surge in China," *USA Today*, August 18, 2005. www.usatoday.com/money/world/2005-08-17-china-nuclear-usat_x.htm; "China's energy supplies are facing increasing pressure as the sector works to support and meet the demands of the country's rapidly growing," *China Energy Weekly*, March 28, 2007. www.lexisnexis.com.
84. United States Senate, Committee on Finance, *Hearing on Opportunities and Challenges in the U.S.-China Economic Relationship*, testimony of Steven Chu, March 27, 2007.
85. "China Sets up State Nuclear Power Technology Co.," *People's Daily*, May 22, 2007. english.peoplesdaily.com.cn/200705/22/eng20070522_376921.html.
86. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.
87. "Contract signed on import of third generation nuclear power," *Interfax News Agency*, May 16, 2007. www.lexisnexis.com.
88. Bonnie Pfister, "Western Pa.'s Westinghouse cements Chinese contract," *Pittsburg Tribune Review*, July 26, 2007. www.pittsburghlive.com/x/pittsburghtrib/news/mostread/s_518785.html; David Winning, "Westinghouse Seals China Deal," *Wall Street Journal*, July 25, 2007. online.wsj.com/article/SB118530110836876396.html.

89. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.
90. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.
91. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
92. "China Sets up State Nuclear Power Technology Co.," *Xinhua*, May 22, 2007. english.peoplesdaily.com.cn/200705/22/eng20070522_376921.html.
93. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
94. Renewable Energy Access.com. "China Renewable Energy and Sustainable Development Report," vol. IV (April 2007), 1. www.renewableenergyaccess.com/download/2007-04-China-RE-Report.pdf.
95. "China's wind power generation capacity may top 5 mln kw next yr—report," *Forbes.com*, April 1, 2007. www.forbes.com/business/feeds/afx/2007/04/01/afx3571158.html.
96. Renewable Energy Access.com. "China Renewable Energy and Sustainable Development Report," vol. IV (April 2007), 1. www.renewableenergyaccess.com/download/2007-04-China-RE-Report.pdf.
97. Chi-Chu Tschang, "China Aims to Clean Up in Solar Power," *Business Week*, April 11, 2007.
98. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
99. U.S. Department of Energy, Energy Information Administration, "China: Electricity." www.eia.doe.gov/emeu/cabs/China/Electricity.html.
100. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
101. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Elizabeth Economy, June 14, 2007.
102. Hu Cong, "Legislature passes renewable energy bill," *China Daily*, March 1, 2005. www.chinadaily.com.cn/english/doc/2005-03/01/content_420450.htm. For a text of the law, see: <http://china.lbl.gov/publications/re-law-english.pdf>.
103. Hu Cong, "Legislature passes renewable energy bill," *China Daily*, March 1, 2005. www.chinadaily.com.cn/english/doc/2005-03/01/content_420450.htm.
104. "INTERVIEW-China energy market needs free prices-U.S.," *Reuters*, April 24, 2007. uk.reuters.com/article/oilRPT/idUKPEK9995920070424.
105. Juli S. Kim, "Transboundary Air Pollution—Will China Choke On Its Success?" China Environment Forum, Woodrow Wilson International Center for Scholars, February 2, 2007. www.wilsoncenter.org/index.cfm?topic_id=1421&fuseaction=topics.item&news_id=218780.
106. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 27.
107. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
108. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007. The International Energy Agency also predicted that China would overtake the United States in carbon dioxide emissions by 2010, but then revised its prediction to 2007 or 2008; Audra Ang, "Group: China Tops World in CO2 Emissions," *Associated Press*, June 20, 2007. www.lexisnexis.com.
109. Audra Ang, "Group: China Tops World in CO2 Emissions," *Associated Press*, June 20, 2007. www.lexisnexis.com.
110. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
111. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Lee Schipper, June 14, 2007.

112. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mun S. Ho, June 14, 2007.
113. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
114. World Health Organization, *Indoor Air Pollution: National Burden of Disease Estimates*, (Geneva, Switzerland: 2007), p. 2; U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
115. World Health Organization, *Indoor Air Pollution: National Burden of Disease Estimates*, (Geneva, Switzerland: 2007), p. 1.
116. World Health Organization, *Indoor Air Pollution: National Burden of Disease Estimates*, (Geneva, Switzerland: 2007), p. 2.
117. Chris P. Nielsen and Mun S. Ho, "Air Pollution and Health Damages in China: An Introduction and Review," *Air Pollution and Health in China*, (MIT Press, Cambridge, MA: 2007), pp. 4–5.
118. Juli S. Kim, "Transboundary Air Pollution—Will China Choke On Its Success?" China Environment Forum, Woodrow Wilson International Center for Scholars, February 2, 2007. www.wilsoncenter.org/index.cfm?topic_id=1421&fuseaction=topics.item&news_id=218780.
119. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jane S. Long, June 14, 2007.
120. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jane S. Long, June 14, 2007.
121. Jeff Barnard, "Atop an Oregon Peak, Evidence of Air Pollution in China," *Associated Press*, July 13, 2007. www.lexisnexis.com. See Robert Lee Hotz, "Huge Dust Plumes From China Cause Changes in Climate Change," *Wall Street Journal*, July 20, 2007, for additional discussion of transboundary aerosol pollution. online www.wsj.com/article/SB118470650996069354.html.
122. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 28.
123. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mun S. Ho, June 14, 2007.
124. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
125. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
126. Yang Yang, "Coal Mining and Environmental Health in China," China Environment Forum, Woodrow Wilson International Center for Scholars, April 2, 2007. www.wilsoncenter.org/topics/docs/coalmining_april2.pdf.
127. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
128. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
129. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, written testimony of Elizabeth Economy, June 14, 2007.
130. Yang Yang, "Coal Mining and Environmental Health in China," China Environment Forum, Woodrow Wilson International Center for Scholars, April 2, 2007. www.wilsoncenter.org/topics/docs/coalmining_april2.pdf.
131. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, written testimony of Elizabeth Economy, June 14, 2007.

132. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
133. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
134. Shai Oster, "China's Bid to Gauge Cost of Pollution Is Set Back," *Wall Street Journal*, July 17, 2007. online.wsj.com/article/SB11846090507536800.html?mod=todays_asia_page_one.
135. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
136. Shai Oster, "China's Bid to Gauge Cost of Pollution Is Set Back," *Wall Street Journal*, July 17, 2007. online.wsj.com/article/SB11846090507536800.html?mod=todays_asia_page_one.
137. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
138. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
139. World Bank, *Costs of Pollution in China: Economic Estimates of Physical Damages*, (World Bank, Washington, DC: February 2007), p. xvii.
140. Juli S. Kim, "Transboundary Air Pollution-Will China Choke On Its Success?" China Environment Forum, Woodrow Wilson International Center for Scholars, February 2, 2007. www.wilsoncenter.org/index.cfm?topic_id=1421&fuseaction=topics.item&news_id=218780.
141. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007; Orville Schell, "Clearing the Air With China," *Washington Post*, April 15, 2007.
142. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
143. Orville Schell, "Clearing the Air With China," *Washington Post*, April 15, 2007.
144. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mun S. Ho, June 14, 2007.
145. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, written testimony of Elizabeth Economy, June 14, 2007.
146. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, written testimony of Elizabeth Economy, June 14, 2007.
147. "China cancels environmental report," *Los Angeles Times*, July 24, 2007.
148. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
149. "Three more held over protests in Xiamen," *South China Morning Post*, July 25, 2007.
150. Edward Cody, "Text Messages Giving Voice to Chinese," *Washington Post*, June 28, 2007.
151. "Three more held over protest in Xiamen," *South China Morning Post*, July 25, 2007; "China arrests activist over chemical plant protest," *Reuters*, July 19, 2007.
152. Liu Jianqiang, "Chinese Urbanites Speaking Out Against Pollution," *Worldwatch Institute*, July 19, 2007.
153. "Mobilised by mobile," *The Economist*, June 21, 2007; Edward Cody, "Text Messages Giving Voice to Chinese," *Washington Post*, June 28, 2007.
154. Jonathan Watts, "China blames growing social unrest on anger over pollution," *The Guardian*, July 6, 2007.
155. Jonathan Watts, "China blames growing social unrest on anger over pollution," *The Guardian*, July 6, 2007.
156. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: 2007), pp. 8-9.

157. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of David Helvey, June 15, 2007.

158. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikkal Herberg, June 14, 2007.

159. Daniel H. Rosen and Trevor Houser, "China Energy: A Guide for the Perplexed," *China Balance Sheet*, (Peterson Institute for International Economics/Center for Strategic Studies, Washington, DC: April 2007), p. 23.

160. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikkal Herberg, June 14, 2007.

161. "China's Sinopec provokes conservation uproar in Gabon," *Agence France-Presse*, September 29, 2005. www.ufoaweb.ualberta.ca/chinainstitute/nav03.cfm?nav03=51093&nav02=43782&nav01=43092.

162. Daily Champion, "Nigeria; Militants Kidnap 10 Chinese Oil Workers," *Africa News*, January 26, 2007. www.lexisnexis.com; "Kidnappers free nine Chinese oil workers in Nigeria," *Agence France-Presse*, February 4, 2007. www.lexisnexis.com.

163. Jeffrey Gettleman, "Ethiopian Rebels Kill 70 at Chinese-Run Oil Field," *New York Times*, April 24, 2007. [www.nytimes.com/2007/04/25/world/africa/25ethiopia.html?n=Top/Reference/Times%20Topics/Subjects/O/Oil%20\(Petroleum\)%20and%20Gasoline;74%20Dead%20in%20Attack%20on%20Chinese%20Oil%20Field%20in%20Ethiopia,%20Official%20Says](http://www.nytimes.com/2007/04/25/world/africa/25ethiopia.html?n=Top/Reference/Times%20Topics/Subjects/O/Oil%20(Petroleum)%20and%20Gasoline;74%20Dead%20in%20Attack%20on%20Chinese%20Oil%20Field%20in%20Ethiopia,%20Official%20Says), *International Herald Tribune*, April 24, 2007. www.iht.com/articles/ap/2007/04/24/africa/AF-GEN-Ethiopia-China-Oil-Attack.php.

164. "China holds anti-terrorist exercise for 2008 Olympics," *People's Daily*, June 20, 2007. english.peopledaily.com.cn/200706/20/eng20070620_385817.html; "Chinese, Russian police end anti-terror drill," *People's Daily*, September 6, 2007. english.people.com.cn/90001/90776/6256841.html.

165. United Nations Security Council, Resolution 1769 (2007).

166. "China, Sudan to ink series of deals on Hu's visit," *Xinhua*, January 24, 2007. news.xinhuanet.com/english/2007-01/24/content_5646074.htm.

167. Sam Beattie, "Chinese Peacekeepers Heading to Sudan," *Voice of America*, October 5, 2007. voanews.com/english/2007-10-05-voa30.cfm.

168. Sebastian Mallaby, "A Palace for Sudan," *Washington Post*, February 5, 2007. www.washingtonpost.com/wp-dyn/content/article/2007/02/04/AR2007020401047.html.

169. Yitzhak Shichor, "China's Darfur Policy," *China Brief*, vol. 7, iss. 7, April 5, 2007, 5.

170. Anita Chang, "China Defends Sudan Investments," *International Business Times*, May 29, 2007. www.ibtimes.com/articles/20070529/china-sudan.htm.

171. Shai Oster, "Fidelity Investments Cuts Stake In PetroChina on Darfur Concerns," *Wall Street Journal*, May 16, 2007.

172. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.

173. "Hu Jintao Calls for Building Strengthened, Modernized Navy," *Xinhua*, December 27, 2007. news.xinhuanet.com/english/2006-12/27/content_5539140.htm.

174. Wu Shengli and Hu Yanlin, "Qiushi: PLA Naval Officials on Building Powerful Navy," *Qiushi (Seeking Truth)*, July 16, 2007. OSC ID: CPP20070716710027. www.opensource.gov.

175. Cited in U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of James Holmes, June 14, 2007.

176. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of James Holmes, June 14, 2007.

177. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Toshi Yoshihara, June 14, 2007.

178. Liu Xinhua and Qi Yi, "China's Oil Security and its Strategic Options," *Xiandai Guoji Guanxi (Contemporary International Relations)* 12 (December 20, 2002): 35-46 OSC ID: CPP20030425000288. www.opensource.gov.

179. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: May 2007), p. 9.

180. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of David Helvey, June 15, 2007.

181. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Toshi Yoshihara, June 14, 2007.

182. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Toshi Yoshihara, June 14, 2007.

183. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of James Holmes, June 14, 2007.

184. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of James Holmes, June 14, 2007.

185. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of James Holmes, June 14, 2007.

186. Global Security.org, "Territorial claims in the Spratly and Paracel Islands." www.globalsecurity.org/military/world/war/spratly-claims.htm.

187. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of David Helvey, June 15, 2007.

188. Olivia Giger, "Kitty Hawk, Allies Complete Malabar Exercise," September 10, 2007. www.navy.mil/search/display.asp?story_id=31737.

189. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of David Helvey, June 15, 2007.

190. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Toshi Yoshihara, June 14, 2007.

191. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Toshi Yoshihara, June 14, 2007.

192. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Toshi Yoshihara, June 14, 2007.

193. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikkal Herberg, June 14, 2007.

194. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikkal Herberg, June 14, 2007.

195. Terence Poon and Shai Oster, "China, Turkmenistan Sign Gas Deals-Analysis," *Wall Street Journal*, July 18, 2007. online.wsj.com/article/SB118467164422868790.html.

196. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikkal Herberg, June 14, 2007.

197. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikkal Herberg, June 14, 2007.

198. For example, see Bruce Pannier, "Eurasia: U.S. Security Expert Talks About SCO Exercises, Summit," *Radio Free Europe/Radio Liberty*, August 9, 2007. www.rferl.org/featuresarticle/2007/08/53F5C1A4-3D0F-46EA-AED8-97D8A788F93E.html; Erica Marat, "SCO Summit Focuses on Energy Cooperation," *Eurasia Daily Monitor*, August 17, 2007. www.jamestown.org/edm/article.php?article_id=2372387.

199. For example, see "Availability of Compilation of DVD of PRC Military Activities in Oct. 06," October 1-31, 2006. OSC ID: CPP20061128017001. www.open-source.gov.

200. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of David Helvey, June 15, 2007.

201. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of David Helvey, June 15, 2007.

202. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.

203. "China to Build Strategic Oil Reserve in West to Store Kazakhstan Crude," *Agence France-Presse*, March 14, 2007. www.lexisnexis.com.

204. "China's second oil reserve in operation-state media," *Reuters*, May 23, 2007. www.uofaweb.ualberta.ca/chinainstitute/nav03.cfm?nav03 = 60785&nav02 = 57484&nav01=57272.

205. "China starts up second strategic petroleum reserves depot: report," *Platts Commodity News*, May 30, 2007. www.uofaweb.ualberta.ca/chinainstitute/nav03.cfm?nav03=60970&nav02=57484&nav01=57272.

206. Erica Downs, *The Brookings Foreign Policy Studies Energy Security Series: China*, (The Brookings Institution, Washington, DC: December 2006), p. 46.

207. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007

208. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.

209. "A cushion of black gold; China and oil," *The Economist*, December 2, 2006.

210. "A cushion of black gold; China and oil," *The Economist*, December 2, 2006.

211. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007; Erica Downs, *The Brookings Foreign Policy Studies Energy Security Series: China*, (The Brookings Institution, Washington, DC: December 2006), p. 46.

212. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.

213. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of David Helvey, June 15, 2007.

214. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Thomas Donnelly, June 15, 2007.

215. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikal Herberg, June 14, 2007.

216. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.

217. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikal Herberg, June 14, 2007.

218. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mikal Herberg, June 14, 2007.

219. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.

220. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.

221. *Curbing Global Energy Demand: The Energy Productivity Opportunity*, (McKinsey Global Institute: May 2007), p. 34

222. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.

223. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Barbara Finamore, July 15, 2007.

224. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.

225. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Saad Rahim, June 14, 2007.
226. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mun S. Ho, June 15, 2007.
227. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
228. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
229. "China cancels environmental report," *Los Angeles Times*, July 24, 2007.
230. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
231. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Barbara Finamore, July 15, 2007.
232. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Barbara Finamore, July 15, 2007.
233. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
234. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
235. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Wayne Rogers, June 15, 2007.
236. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mun S. Ho, June 14, 2007.
237. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Trevor Houser, June 14, 2007.
238. For discussion of a carbon tax, see Maximilian Auffhammer and Richard Carson, "China's Chance to Lead," *Washington Post*, August 2, 2007. www.washingtonpost.com/wp-dyn/content/article/2007/08/01/AR2007080102049.html.
239. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Kelly Sims Gallagher, June 15, 2007.
240. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Wayne Rogers, June 15, 2007.
241. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Wayne Rogers, June 15, 2007.
242. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Wayne Rogers, June 15, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Kelly Sims Gallagher, June 15, 2007.
243. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
244. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, submitted written testimony of Elizabeth Economy, June 14, 2007.
245. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.

246. U.S.-China Economic and Security Review Commission, *Hearing on the U.S.-China Relationship: Economics and Security in Perspective*, testimony of David L. Pumphrey, February 1, 2007.
247. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
248. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
249. U.S. Department of Energy, "F-Tomorrow's Pollution-Free Power Plant." www.fossil.energy.gov/programs/powersystems/futuregen/.
250. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Michael Mudd, June 15, 2007.
251. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
252. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Michael Mudd, June 15, 2007.
253. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Michael Mudd, June 15, 2007.
254. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
255. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
256. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
257. U.S. Environmental Protection Agency, "The Integrated Environmental Strategies (IES) Program in Beijing, China." www.epa.gov/integen/documents/beijing/beijing_508_factsheet.pdf.
258. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007.
259. Methane to Markets Partnership, "Methane to Markets Partnership Fact Sheet." www.methanetomarkets.org/resources/factsheets/partnership_fs_eng.pdf.
260. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of S.T. Hsieh, June 15, 2007.
261. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of S.T. Hsieh, June 15, 2007.
262. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of S.T. Hsieh, June 15, 2007.
263. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Wei-Ping Pan, June 15, 2007.
264. U.S. Department of Energy Press Release, "U.S. and China Announce Cooperation of FutureGen and Sign Energy Efficiency Protocol at U.S.-China Strategic Economic Dialogue," December 15, 2006.
265. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007.
266. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Judith Ayres, June 14, 2007.
267. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jane Long, June 14, 2007.
268. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Karen Harbert, June 14, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Con-*

sumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use, testimony of Jeffrey Logan, June 15, 2007.

269. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jane Long, June 14, 2007.

270. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jeffrey Logan, June 15, 2007.

271. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jeffrey Logan, June 15, 2007.

272. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jeffrey Logan, June 15, 2007.

273. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Jennifer Turner, June 14, 2007; U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Mun S. Ho, June 14, 2007.

CHAPTER 4
CHINA IN ASIA
SECTION 1: TAIWAN

“The Commission shall investigate and report on—

“REGIONAL ECONOMIC AND SECURITY IMPACTS—The triangular economic and security relationship among the United States, [Taiwan], and the People’s Republic of China (including the military modernization and force deployments of the People’s Republic of China aimed at [Taiwan]), the national budget of the People’s Republic of China, and the fiscal strength of the People’s Republic of China in relation to internal instability in the People’s Republic of China and the likelihood of the externalization of problems arising from such internal instability.”

In August 2007 a Commission delegation traveled to Taiwan to review important issues and developments in the United States’ economic and security relationship with the island, the status of Taiwan’s relationship with the People’s Republic of China, and whether U.S. commitments to Taiwan under the 1979 Taiwan Relations Act (TRA) are being upheld. During the trip, Commissioners visited both Taipei and Kaohsiung where they had conversations with senior representatives of Taiwan’s governing authority, academicians and policy experts, officials of the American Institute in Taiwan, American businessmen working in Taiwan, and others about U.S.-Taiwan bilateral relations, Taiwan’s economic and trade relationship with the United States and the PRC, Taiwan’s self-defense capabilities, and political developments on the island. In some cases, this Commission report will not attribute statements to individuals at their request to protect their anonymity.

Why Taiwan is Important to the United States

The island of Taiwan is home to more than 23 million people from a variety of ethnic and religious backgrounds. Over the last several decades, the island has transformed itself from an agrarian economy ruled by a single party to a full-fledged, vigorous democracy with world-class industry and a burgeoning high-tech sector. Living standards, political enfranchisement, and opportunities for Taiwan’s people have grown significantly, as has the island’s relationship with the United States.

Taiwan's young democracy has been lauded as a successful democratic system.¹ Following the end of martial law in 1991, the island conducted its first Presidential election in 1996. Four years later, in 2000, Taiwan experienced its first peaceful transfer of Presidential power. Policymakers and academics often cite Taiwan's success in establishing a functioning democratic governmental system as demonstrating that Chinese culture and democracy are compatible.

Protection of human rights, adherence to rule of law, and freedom of expression also have grown substantially on the island over the last several decades. Freedom House, a nongovernmental organization that evaluates the degree of freedom accorded to the citizens of all nations, labels Taiwan as a free society.² In a recent U.S. Department of State report on human rights, Taiwan received high marks for privacy rights, freedom of speech and the press, freedom of religion, freedom to assemble, and Internet freedom.³ In those areas where the report identified deficiencies, including high levels of violence towards women, child abuse, and human trafficking,⁴ Taiwan's political leaders have made commitments to make further progress.⁵

Taiwan's importance to the United States as an economic partner has grown significantly over the last twenty years. Between 1986 and 2006, bilateral trade between Taiwan and the United States has increased in total value more than ten-fold (in dollars unadjusted for inflation), from US\$5.5 billion to US\$61.2 billion,⁶ and Taiwan currently stands as the United States' eighth largest trading partner.⁷ (It ranked sixth in 1986.⁸) Taiwan's importance as a producer of high technology products is well known. The Institute for International Economics reports that Taiwan's "IT sector is a source of strength both to Taiwan itself and to consumers of IT products in the United States."⁹

Underpinning the U.S. relationship with Taiwan is the Taiwan Relations Act (TRA). When the United States established official diplomatic relations with the People's Republic of China in 1979, the TRA was enacted to redefine the U.S. relationship with Taiwan after American derecognition. The TRA also describes U.S. security commitments to the island and requires the United States "to provide Taiwan with arms of a defensive character" and "to maintain the capacity of the United States to resist any resort to force or other forms of coercion that would jeopardize the security, or the social or economic system, of the people of Taiwan."¹⁰

The United States has an interest in maintaining peace and stability in the Taiwan Strait. According to a speech given by Deputy Assistant Secretary of State Thomas Christensen on September 11, 2007, "As a Pacific power with global interests and obligations, the United States has a natural interest in peace throughout Asia. Because the Taiwan Strait is a potential flashpoint for conflict, the area demands [the United States'] constant attention."¹¹ Successive U.S. Presidents also have affirmed America's interest in Taiwan.

American allies in the region often monitor this relationship to gauge U.S. attitudes on East Asian security. Indeed, one knowledgeable source referred to Taiwan as a "canary in the coal mine." The U.S.-Taiwan relationship, and the way in which the United

States addresses it, are of particular importance to Japan—which sees the possibility of future strategic competition or even an adversarial relationship with China, and which views its alliance with the United States as being vital to Japanese interests in many of the same ways that Taiwan’s relationship with the United States is vital to Taiwan’s survival as a self-governing democracy. In 2005 Japan joined the United States in issuing a statement¹² that Taiwan and the Taiwan Strait are a “common security concern” for both nations and that easing tensions across the Strait is a “common strategic objective.”

Taiwan is situated roughly 100 miles from the coast of China’s Fujian province, 200 miles north of the Philippines, and 300 miles southwest of Okinawa. Because of its location, some PRC military strategists have suggested it would be of value to the PRC in extending its “defensive” perimeter and improving its ability to influence regional sea lines of communication.¹³ According to one PLA military science text:

If Taiwan should be alienated from the mainland, not only [would] our natural maritime defense system lose its depth, opening a sea gateway to outside forces, but also a large area of water territory and rich resources of ocean resources [sic] would fall into the hands of others. . . . [O]ur line of foreign trade and transportation which is vital to China’s opening up and economic development will be exposed to the surveillance and threats of separatists and enemy forces, and China will forever be locked to the west of the first chain of islands in the West Pacific.¹⁴

Taiwan Political Situation

Taiwan as a political entity is formally known as the Republic of China (ROC), and traces its roots back to the fall of China’s Qing Dynasty in 1911. The government of the ROC ruled all of China until 1949 when, after several key defeats by Communist forces under Mao Zedong during the Chinese Civil War, the ROC ruling party, the Kuomintang (KMT), and its military commander and political leader Chiang Kai-shek retreated to Taiwan and established a government in exile. For the next several decades Chiang and the KMT governed Taiwan. Early in the KMT’s rule, the ROC government responded with force to an uprising among the local population, known as the “228 Incident,” which killed thousands of native Taiwanese. While the ROC’s rule on Taiwan became less violent over time, the single-party government continued martial law. The legacy of this period is still evident today in political rifts between elements of Taiwan’s society.

After martial law ended in 1991 and political reforms were instituted throughout the 1990’s, democracy took root in Taiwan. Its first Presidential elections took place in 1996 and the KMT’s candidate was elected, but four years later, in 2000, a member of the opposition Democratic Progressive Party (DPP), former Taipei mayor Chen Shui-bian, was elected President. His election ended fifty years of KMT power in Taiwan, and was hailed as a significant milestone in Taiwan’s democratization.

President Chen had campaigned on a platform of declaring Taiwan's independence from mainland China. However, during his first term as President, he distanced himself from that pledge in order to lower cross-Strait tensions. This change was reflected in his "Four No's Plus One"¹⁵ statement issued at his inauguration. Eighteen months after President Chen's election, the KMT lost direct control of Taiwan's legislature, the Legislative Yuan (LY), although the party managed to retain a slim majority by "cobbling together a working coalition from its own remnants."¹⁶ This coalition of the KMT and former KMT factions, known as the Pan-Blue Coalition, has since maintained control of Taiwan's LY. The legislative-executive split has produced "political stalemate and infighting [that have] continued to characterize Taiwan's political scene."¹⁷

President Chen was reelected narrowly in 2004, and his second term has been considerably more contentious than his first. Taiwan's LY has experienced near-constant deadlock regarding major issues since 2004, and a series of scandals have hit President Chen's family.¹⁸ Furthermore, President Chen has seemingly backed away from his "Four No's Plus One" pledge; in 2005 he "ceased the functioning of"¹⁹ the National Unification Council and Guidelines that the "Four No's" pronouncement said would never be eliminated. President Chen also is planning an island-wide referendum on applying for United Nations membership under the name "Taiwan," a move Beijing asserts violates both its "One China Principle" and a vow President Chen made not to change the island's formal title. Numerous times the U.S. government has concluded it is necessary to distance itself from President Chen's statements or stated objectives, and on occasion has directly criticized his stances or comments pertaining to independence.

Two major elections will take place in Taiwan in 2008. In January, members of the Legislative Yuan will be elected, and in March 2008, Taiwan voters will elect a new President. The LY elections will usher in an extension of the terms of legislators from three to four years, which will bring the LY's electoral cycle in sync with Taiwan's Presidential election cycle; shift the LY to single-member districts; and reduce by half the number of seats—from 225 to 113.

Taiwan's Presidential elections are scheduled in March 2008. As has been true for all Presidential contests in Taiwan in recent years, the major issues for this election to date have been Taiwan's political status and its relationship with the PRC. The DPP historically has favored independence, while the KMT has been more accepting of Chinese concerns. It is widely agreed that no candidate will win the election without the support of centrist voters who typically embrace the status quo of *de facto* Taiwan independence. Issues like constitutional reform, strengthening Taiwan's economy, and fighting corruption also are playing a part in the campaign.

The DPP has nominated former Kaohsiung mayor Frank Hsieh as its candidate for President. Mr. Hsieh is perceived as slightly more moderate than President Chen on cross-Strait issues, particularly on trade and investment links, although he is supporting President Chen's contentious referendum on applying for U.N. membership under the name "Taiwan."²⁰ His platform includes continued efforts to modernize Taiwan's military and a willingness to appropriate the necessary funds to do so.²¹ Mr. Hsieh also has

promised to improve Taiwan's relationship with the United States. He recently visited Washington to meet with Administration officials and Members of Congress on a trip he entitled "the trip of love and trust."²²

The KMT has nominated former Taipei mayor Ma Ying-jeou as its candidate. Mr. Ma is campaigning on a different approach to cross-strait relations. At a meeting with the Commission's delegation in August 2007, he denounced President Chen's U.N. referendum and promised to improve Taiwan's relationship with the PRC. Mr. Ma said that he hopes to negotiate a "peace agreement" with Beijing and wants to deepen economic integration with the PRC, perhaps even forming a common market.²³ Mr. Ma's approach to the cross-strait relationship causes some to question his level of commitment to further strengthening Taiwan's military. Mr. Ma responds that a better relationship with the PRC will result in a reduced need for military forces and investments in them. He also insists that any agreement with the PRC would be predicated on Beijing removing its missiles targeting Taiwan from across the Taiwan Strait.²⁴

The outcome of the coming elections will have a major impact on U.S. policies in the region. The U.S. government officially is neutral in the 2008 elections, and sees it as fortunate that both Presidential candidates have taken more moderate stances on cross-strait issues than President Chen, which could help cool tensions between Taipei and Beijing.

Status of Cross-Strait Relations

Political relations

For decades Taipei and Beijing have been at odds over conflicting claims to sovereignty. China's "One China Principle" declares that Beijing is the legitimate authority for all China, including the island of Taiwan. The United States chose to acknowledge Beijing's perspective in the 1979 U.S.-China Joint Communiqué, but did not say it agreed with that perspective. For itself, the U.S. government has taken no position on Taiwan's sovereignty. Neither major political party in Taiwan accepts the "One China Principle" as stated by the PRC.

Since its political liberalization, Taiwan's people have reassessed the nature of their national character and their relationship to the PRC. While Taiwan has derived much of its culture from mainland China, its people increasingly see themselves as no longer strictly "Chinese" and instead have begun to embrace a national identity that is independent of the mainland.²⁵ This change of views has been encouraged by the DPP. Many Taiwan residents, however, recognize the risk of antagonizing the PRC on an issue that greatly matters to it, and with respect to which its leadership effectively has painted itself into a corner, leaving it little choice but to respond with armed force if Taiwan pursues the issue of independence.²⁶ For this reason, the majority of Taiwan residents prefer for their government not to push the matter too far, but instead to continue to enjoy *de facto* independence.

From the Chinese perspective, Taiwan historically has been, and remains, intrinsically a part of China. Beijing argues that it is Tai-

wan's legitimate sovereign and readily cites a multitude of international documents it says support this assertion.²⁷ China's Propaganda Department frequently uses Taiwan to externalize domestic problems and distract Chinese citizens from focusing on salient issues at home.²⁸

No high-level meetings between PRC and Taiwan officials have been held since 1992, when they met in Hong Kong to discuss the nature of their conflicting claims to sovereignty—which is seen as a high point in cross-Strait relations. Since that time, China has demanded that Taiwan acknowledge what Beijing calls the “1992 Consensus” regarding the PRC's “One China Principle” as a precondition for further negotiations, and Taiwan has refused.²⁹ While there have been no high-level meetings in over a decade, some peripheral progress in China's and Taiwan's bilateral relationship has been achieved. For example, postal, transportation, and economic links across the Strait have been established and then expanded and enhanced. Recently, Beijing and Taipei agreed to permit direct annual charter flights across the Strait.

In March 2005 Beijing enacted the Anti-Secession Law that typifies the way China has dealt with Taiwan. The law codified Beijing's longtime threat to use “non-peaceful means” to regain control of Taiwan in the event Taiwan declares independence, or Beijing concludes that all possibility of peaceful unification is lost.³⁰ The law met with international criticism and fueled massive protests in Taipei. Beijing had hoped to strongly warn Taiwan's leadership not to further distance Taiwan from PRC claims to the island, but instead the action catalyzed support among Taiwan's people for many of the policies it had aimed to deter.

PRC actions like the Anti-Secession Law fuel responses from Taipei. President Chen recently has sought U.N. membership under the name Taiwan, and currently is advocating a referendum in Taiwan to assess the population's wishes on that matter—despite the U.N.'s rejection of Taiwan's prior requests for membership. China, to date, has refrained from significantly worsening the situation by threatening the island with force, and instead has voiced concern to the United States and asked for it to intercede with the Chen government to persuade it to halt this effort. In September 2007 Deputy Assistant Secretary of State Christensen characterized the referendum as a “needlessly provocative action” and said the United States “opposes such an initiative strongly.”³¹ Thus far, President Chen has been unresponsive to U.S. concerns.

It is important for concerned observers of the PRC-Taiwan dialogue to understand that the rhetorical intensity in recent months can be better understood in the context of the political situation in both locations. In October 2007 the PRC held its 17th Party Congress. In the lead-up to Party Congresses, China's leadership traditionally has made strong statements on the Taiwan issue, and taken related actions intended to rally support around the CCP and to stimulate nationalism. For example, China's President Hu Jintao recently promoted several PLA generals who have been responsible for China's Taiwan military contingencies. As noted above, Taiwan will conduct both Presidential and Legislative Yuan elections early in 2008, and its politicians traditionally have made

aggressive statements about Taiwan's status as Presidential and legislative elections draw nearer.

Economic relations

While the political relationship between Taiwan and the PRC has been tense for the past 50 years, businesses in both places have acted in ways that increasingly have tied the two economies to each other. It is estimated that one million Taiwan citizens live and work in China.³² For the last several decades entrepreneurs from Taiwan steadily have invested large sums of money in the PRC. While Taiwan has laws to regulate the volume and composition of these investments, Taiwan businesspeople are circumventing these rules by investing through intermediaries situated outside the legal reach of Taiwan's control (such as in the Cayman and Virgin Islands). Most knowledgeable experts estimate that Taiwan has somewhere between US\$150 billion and US\$250 billion³³ invested across the Strait (as a point of comparison, the United States has invested only US\$48 billion in China), a number well above the officially approved limit of US\$58 billion.³⁴ China is estimated to be dependent on Taiwan for as much as one-tenth its total FDI,³⁵ making Taiwan China's largest investor.³⁶ Such investments create and nurture very strong links by establishing a heavy degree of economic interdependence between Taiwan and the PRC. Some believe these ties may serve as a stabilizing force across the Strait, with both sides understanding that the blow to the standard of living and the social upheaval resulting from an armed conflict would be very costly. The economic links have brought with them peripheral improvements in relations, or at least pressures to make real efforts to achieve such improvements, such as establishing regular direct cross-Strait flights. KMT Presidential candidate Ma has gone so far as to propose establishing a common market with the PRC if he is elected in March.³⁷

Taiwan's Security

Military preparedness and deterrence

Over the last several decades the balance of military power across the Taiwan Strait has shifted significantly in the PRC's favor. Taiwan's defense spending has declined steadily as a percentage of Taiwan's GDP over the last decade, while a surge in China's People's Liberation Army (PLA) expenditures and capabilities—particularly those directly associated with Taiwan—have outpaced the island's defensive abilities.³⁸ The reality is that Taiwan simply is incapable of winning an arms race with China. Because of this, Taiwan has concentrated its defense efforts and investments on capabilities designed to hold off the PLA until U.S. and possibly other allied forces can arrive to help halt an attack and repel an invasion. Ultimately, Taiwan's entire defense strategy is rooted in U.S. military intervention.

Then-Secretary General of Taiwan's National Security Council Mark Chen described recent trends in cross-Strait military asymmetries when he met in August 2007 with the Commission delegation to Taiwan. "In 2000 the PLA had 200 ballistic missiles

pointed at Taiwan from across the Strait; today they have over 1000.”³⁹ He acknowledged that Taiwan is incapable of effectively countering China’s surge in capabilities and resources. Taiwan’s Defense Minister, Lee Tian-yu, reinforced Secretary General Chen’s remarks, saying that in every war game Taiwan has conducted, it has lost to the PLA when it has fought alone. Regardless of this, Minister Lee declared that “Taiwan still has teeth and will certainly fight until the end—we will damage them severely.”⁴⁰

Critics of Taiwan’s defense efforts typically cite a general decline in the percentage of Taiwan’s GDP it has allocated to the island’s defense budget (that stands at 2.85 percent of GDP).⁴¹ President Chen has vowed to increase that budget to three percent of GDP before leaving office, and the Legislative Yuan recently approved an increase to US\$9.21 billion, a 20.8 percent increase from the previous year.⁴²

While its level of defense expenditures is one indication of the seriousness with which Taiwan approaches the challenge of defending itself, close observers do not believe expenditures alone reliably and accurately convey the full picture. Taiwan has made significant strides to enhance its defense capabilities in recent years by investing in a variety of weapon systems produced both domestically and abroad, including indigenously-produced CM-32 “Cloud Leopard” armored personal carriers and KH-6 fast attack missile boats, and a variety of sophisticated electronics equipment it has purchased from the United States. Taiwan also has modernized the structure of its military by creating a non-commissioned officer corps, augmenting its early warning radar systems, expanding its ballistic missile defense capabilities, and enhancing contingency training for its forces.

The United States is mindful of the reality that Taiwan cannot long survive an attack or invasion by the PRC without intervention by U.S. and possibly other allied forces. Any success in defeating PRC aggression against Taiwan will be greatly aided by the degree to which Taiwan and the forces of other nations that intervene on its behalf are able to coordinate and share the tasks of such an effort. For this reason, the United States has urged Taiwan to enhance its ability to conduct joint operations with allied forces, and Taiwan has made significant progress toward this goal. U.S. forces have been advising Taiwan military planners on how to conduct joint operations and have sent observers to Taiwan’s Han Kuang military exercises for the last several years.

Reflecting considerations that have guided its own defense policy and procurements, the United States has urged Taiwan to increase its use of, and integrate in its doctrine, enhanced command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR)⁴³ abilities, so that its forces can be utilized most efficiently, effectively, and quickly against an adversary. Taiwan has taken significant steps to employ these force multipliers.

Taiwan's Net-Centric Warfare Capabilities and the Po-Sheng Project

With U.S. government assistance and approval for the involvement of U.S. defense contractors, Taiwan has been engaged in a major project to modernize its command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) warfare capabilities. During the visit of a Commission delegation to Taiwan in August 2007, Taiwan's Ministry of National Defense briefed the delegation on these efforts and demonstrated some of its new C4ISR capabilities. A major example is the multibillion U.S. dollar modernization project known as "Po-Sheng" or "Broad Victory," which has significantly advanced Taiwan's C4ISR capabilities, and therefore has enhanced the reach and lethality of its defensive forces. It is designed to enable Taiwan to reduce its losses in a conflict, slow the advancement and effect of PLA forces, and extend the amount of time available for the United States and other allies to decide whether to join Taiwan in a coordinated defense and, if so, for their forces to arrive and engage. The program is still underway and further improvements are expected to be realized.

The key controversy in Taiwan's defense spending is associated with an arms package offered to Taiwan in 2001 with Bush Administration approval. The original package, valued at US\$18 billion, was composed of eight diesel-electric submarines, 12 P-3C Orion anti-submarine warfare (ASW) aircraft, and a Patriot Advanced Capability 3 (PAC-3) surface-to-air missile system. This proposal became a political football between the DPP presidency and the KMT-led Legislative Yuan. After the LY Procedural Committee rejected previous proposals more than 100 times, a compromise was reached in June 2007 that allocates funding to purchase the P-3C aircraft, upgrade a number of older PAC-2 missiles and their equipment, and conduct a feasibility study for the submarine package. The LY also approved initial funding for the procurement of additional F-16 fighters from the United States; however, the Bush Administration to date has not approved this request.⁴⁴

Another controversy regarding Taiwan's defensive capability is the question of whether the island should develop its own counterstrike capabilities. Currently, Taiwan has only a limited ability to counterattack targets on China's mainland in the event of PRC aggression. Some within Taiwan's defense establishment believe Taiwan can significantly challenge Beijing's willingness to use force against the island by developing powerful conventional counterstrike abilities targeted on significant PRC military, economic, and population centers.⁴⁵ The United States has opposed such measures, arguing that deployment of long-range missiles capable of striking targets on the mainland would not contribute to the island's ability to deter China; likely would provide only limited operational benefits; and could further complicate the already daunting escalation-control problems that would face the United States and others in the event of a cross-Strait conflict.⁴⁶ Proponents of the counterstrike missiles respond that the system

would be cheaper and more effective than purchasing expensive defensive weapon systems like the PAC-3 to blanket the island and shield it from PLA missile strikes.

Container Security Initiative in Taiwan

While Taiwan does not face serious threats from acts of international terrorism, it is committed to keeping the island from becoming a springboard for such activities, according to Mr. Kuo Lin-wu, the Director of Taiwan's Counterterrorism Office, with whom Commissioners met in Taipei.⁴⁷ Taiwan, therefore, is cooperating with the United States on a variety of initiatives to secure the international shipping system from acts of terrorism. It currently is participating in the U.S. Container Security Initiative (CSI) intended to scrutinize the contents of all shipping containers destined for the United States before they reach U.S. ports; it has agreed to participate in the Megaports Initiative that will screen shipments for nuclear and other radiological materials; and it has expressed interest in joining the Proliferation Security Initiative (PSI) the United States established to coordinate international efforts to interdict suspected shipments of WMD, WMD components, and equipment that could be used to manufacture WMD.

Port Security in Taiwan: Kaohsiung Harbor

While in Taiwan in August 2007, the Commission delegation visited the island's largest port facility which is in Kaohsiung—Taiwan's second most populous city located near the southern end of the western side of the island. The Port of Kaohsiung is one of the world's largest and busiest ports, handling 57 percent of Taiwan's international trade volume and more than 73 percent of the island's container traffic.⁴⁸ The facility receives the majority of Taiwan's petrochemical imports (which are refined locally), and contains a major Free Trade Zone (FTZ).⁴⁹ Because of the export-oriented nature of Taiwan's economy, the port is of vital importance to the island.

Due to the high levels of trade between the United States and East Asia, the Port of Kaohsiung is important to the United States as well. Because the harbor's deep waters can be used by the largest container ships—which are able to move goods efficiently across the Pacific—cargo from other ports in the region that lack Kaohsiung's facilities and deep waters often is transshipped through Kaohsiung, where it is moved from smaller ships onto larger trans-ocean ships. The facility is a major hub for ocean-going freight between North America and East Asia.

Ships leaving this harbor dock at ports in Vancouver, Seattle, San Francisco, Oakland, Los Angeles, Long Beach, San Diego, Boston, New York, Baltimore, and New Orleans. U.S. Customs and Border Protection of the Department of Homeland Security reports that the harbor handled 369,500 direct shipments and 716,000 transshipments to the United States in the year 2006.⁵⁰

Port Security in Taiwan: Kaohsiung Harbor—Continued

Due to the high volume of shipments leaving Kaohsiung destined for the United States, the United States has sought Taiwan's cooperation on a variety of port and shipping security programs. Under the U.S. Customs and Border Protection's Container Security Initiative, the paperwork for all container shipments bound for the United States is examined. All Bills of Lading are checked, suspect containers are x-rayed, and some containers are physically inspected.⁵¹ The port also has agreed to participate in the U.S. Megaports initiative. Twenty-five radiation detectors are being installed throughout the port facility to monitor shipments for dangerous nuclear and radiological cargo. Personnel at the Kaohsiung office of the American Institute in Taiwan commended Taiwan authorities for their help and responsiveness, saying that no other port in the world has been more cooperative.⁵²

Diplomatic efforts

Taiwan's democratization has brought with it the classic "guns versus butter" argument. According to Ms. Elizabeth Hague, who was a China research analyst at the RAND Corporation, politicians in Taiwan, especially those affiliated with the KMT, have argued that more money should be spent on social welfare programs rather than given to the military.⁵³ The realization that it cannot spend limitless sums on its military is one reason Taiwan has placed great emphasis on maintaining "soft power" through preserving the commitment and support of its allies, and by trying to prevent erosion in the number of nations that recognize it diplomatically.

Taiwan currently counts 24 nations that diplomatically recognize the Republic of China, rather than the People's Republic of China, as the legitimate sovereign of greater China. Recently, Taiwan's Foreign Minister James Huang explained that diplomatic allies not only afford Taiwan a degree of national pride, but also strengthen Taiwan's position in any negotiation with the PRC because they enable Taipei to deal with Beijing on an equal footing.⁵⁴ The PRC has gone to great efforts, using large packages of various kinds of aid and other inducements, to persuade those nations that recognize the Republic of China to switch their recognition. Taiwan believes its only realistic response is to make counteroffers. To date, Taiwan's "dollar diplomacy" has prevented the PRC from vanquishing Taiwan in this competition, but the PRC slowly is winning what has become a war of attrition by utilizing an array of inducements with which Taiwan simply is unable to compete.

Taiwan and the PRC also have been engaged in a series of diplomatic skirmishes, with Taiwan working to increase its acceptance and participation in international organizations, and the PRC working just as assiduously to deny membership and participation in such organizations to Taiwan. A member of the United Nations until its seat was taken by the PRC in 1971, Taiwan since that time has applied for membership 15 times and has been denied on each occasion. China works actively to oppose Taiwan's inclusion.⁵⁵

Taiwan also has been denied membership in the World Health Organization (WHO) for similar reasons.

Taiwan is working on another front to maintain a place in the international system and prevent the PRC from isolating it. Taiwan's leaders have been advocating the establishment of Free Trade Agreements (FTA) with nations with which it has strong economic relations, notably including the United States. Not surprisingly, Beijing objects, and is working to dissuade nations from entering into such agreements with Taiwan.⁵⁶ Taiwan believes such an agreement with the United States would benefit both parties economically and encourage other nations to brave Beijing's objections to establish comparable arrangements with Taiwan. Taiwan fervently believes this would have very significant salutary economic and diplomatic effects.

The Bush Administration thus far has not been enthusiastic about the prospect of a U.S.-Taiwan FTA. Ambassador Karan Bhatia, Deputy U.S. Trade Representative, has said that achieving such an agreement will be difficult not only because Trade Promotion Authority (TPA)⁵⁷ has expired, but also because Taiwan still must correct a number of economic problems in several fields that would make such an agreement unworkable for the United States, such as "intellectual property rights, pharmaceutical pricing regulations, government procurement, agricultural trade, and telecoms sector regulations."⁵⁸ The Administration also believes that such an FTA would complicate relations with China. While few individual U.S. businesses have openly supported establishing an FTA with Taiwan, both the American Chamber of Commerce in Taipei and the U.S.-Taiwan Business Council have expressed support for the proposal.⁵⁹

Conclusions

- Taiwan's 2008 Presidential and legislative elections raise a number of significant issues in cross-Strait and U.S.-Taiwan relations.
- Tensions between Taiwan and China have created an emotionally-charged stand-off that risks armed conflict if not carefully managed by both sides. Such a conflict could involve the United States.
- Economic links between Taiwan and China have grown significantly over the last several decades. Currently, it is estimated that Taiwan businesses have between US\$150 billion and US\$250 billion invested in the PRC, accounting for one-tenth of China's total foreign direct investment and making Taiwan China's largest investor. Some think these economic links act as a stabilizing force, while others are concerned that they strengthen China's military-industrial complex to the potential detriment of Taiwan.
- Although Taiwan's defense spending has declined as a percentage of GDP, it has continued to enhance its self-defense capabilities in meaningful ways. The United States has been encouraging Taiwan to enhance its ability to engage in joint and combined operations, and to expand and improve its C4ISR abilities,

naval operations, and missile defense. Taiwan has made notable progress in some of these areas.

- Partisan politics in Taiwan have prevented the achievement of a consensus concerning which steps it needs to take and what weapon systems it needs to acquire to give it optimum defensive capability. This weakens its ability to deter Chinese aggression.
- Taiwan desires to establish a Free Trade Agreement (FTA) with the United States. It sees such an agreement as offering not only economic benefits but also diplomatic leverage it believes will be crucial to preventing the PRC from further isolating the island. For a number of reasons, the Administration has indicated it currently is unable to move forward on an FTA with Taiwan.

SECTION 2: INDIA

“The Commission shall investigate and report on—

“REGIONAL ECONOMIC AND SECURITY IMPACTS—The triangular economic and security relationship among the United States, [Taiwan], and the People’s Republic of China (including the military modernization and force deployments of the People’s Republic of China aimed at [Taiwan]), the national budget of the People’s Republic of China, and the fiscal strength of the People’s Republic of China in relation to internal instability in the People’s Republic of China and the likelihood of the externalization of problems arising from such internal instability.”

A Commission delegation traveled to New Delhi, India in August 2007 to discuss with Indian experts and U.S. government personnel perspectives on China’s development, Sino-Indian relations, and the impact of Chinese regional influence on U.S. security and relations in Asia. The delegation met with academicians, policy experts, former diplomats and government officials, personnel of government-funded think tanks and research organizations, and a representative of the Tibetan government in exile.⁶⁰ In some cases, this Commission report will not attribute statements to individuals at their request to protect their anonymity.

Introduction to Sino-Indian Relations

China and India have a long history of political, economic, cultural, and religious relations extending back to the first century A.D. In the mid-twentieth century, China and India both underwent significant political transformations, with India gaining independence from the United Kingdom in 1947, and the Communist Party under Mao Zedong seizing control of China and forming the People’s Republic of China in 1949. In the following years, both countries aspired to lead the developing world and joined the “non-aligned” movement with its Five Principles of Peaceful Coexistence.⁶¹ These principles are: “mutual respect for sovereignty and territorial integrity, mutual non-aggression, non-interference in each other’s internal affairs, equality and mutual benefit, and peaceful coexistence.”⁶²

However, in 1962, after a decade of building tension, China and India engaged in a short war over border territories—an event that has become pivotal in the minds of Indian policymakers and in their approach to Sino-Indian relations. When China invaded Tibet in 1950, India’s leadership sent a small force to India’s disputed

northeast boundary with Tibet, known as the McMahon Line. In 1955, when China constructed a military supply route linking Tibet to Xinjiang province along the McMahon line, India responded with an increased military presence at the border and there was a series of minor border skirmishes over the next several years. Developing Indian diplomatic relations with the United States and a general military buildup across India convinced Chinese authorities that India was preparing to launch an incursion across the McMahon line; China responded by attacking an Indian border outpost in September 1962. Full-scale conflict lasted only a few months and resulted in a complete military victory for the Chinese and withdrawal of Indian forces. In November 1962 Chinese Premier Zhou Enlai announced a cease-fire and withdrew Chinese forces to 20 kilometers behind the “line of actual control” (the McMahon Line), keeping the Xinjiang-Tibet road under Chinese control but ceding the rest of the territory back to India.⁶³ Since that time, there have been minor skirmishes, but no full-scale attacks. However, this border region remains an area of tension and conflict between the two countries.

After the Cold War ended in the early 1990’s, both countries resumed engagement and began increasing trade, while also addressing border disputes. One academic noted that the most important recent change in Sino-Indian relations is the adoption of healthy realism by both nations. In the academic’s opinion, Indian and Chinese policymakers realize there is great economic potential in trade between the two countries, and they are willing to separate contentious issues such as border disputes from the pursuit of trade and economic ties. In 2005 China and India held a strategic dialogue and established a “strategic and cooperative partnership.”⁶⁴ Further, in June 2007, External Affairs Minister Shri Pranab Mukherjee stated, “While we remain fully conscious of our outstanding differences with China, including on the boundary question, the basic paradigm of our approach is to seek an all-around development of ties, without allowing these differences to define the agenda of the relationship . . . [T]he India-China partnership is an important determinant for regional and global peace and development, and for Asia’s emergence as the political and economic center of the new international order.”⁶⁵

Yet a healthy dose of Indian suspicion and skepticism toward China remains and is growing. This was an evident motivator for India’s efforts to acquire nuclear capability; indeed, New Delhi stated that it acquired nuclear capacity because of the threat China poses to India, as well as China’s nuclear assistance to neighboring Pakistan with which India has a troubled history.⁶⁶ Today, this suspicion is expressed through a cautious approach by India to trade and security relations with China—for example, in protection of certain economic sectors from Chinese investment, in wariness towards China’s military modernization and in initiatives for security cooperation with China; and in development of stronger relationships with other countries on the Pacific Rim including the United States.

Significant Issues in Sino-Indian Relations

Deepening Economic Relations

Sino-Indian trade has grown rapidly in the past five years, bolstered by the declaration of a “strategic and cooperative partnership” in 2005, and the symbolic opening of border passes to facilitate trade. In 2000, bilateral trade equaled \$2.91 billion. By 2006, trade between the two countries totaled \$25 billion. With this growth, India became China’s tenth largest trading partner.⁶⁷ China is on track to become India’s largest trading partner after the United States.⁶⁸ Indian exports to China are dominated by iron ore, whereas Chinese exports to India are comprised of manufactured goods such as electronics and machinery.⁶⁹ China is investing in India’s infrastructure development—totaling \$50 million in 2006— even though the New Delhi government has limited Chinese investment in sectors such as ports and telecom.⁷⁰ “Indian investment in China currently stands at \$130 million,” compared to the United States’ investment of \$54 billion in China (see Chapter 1, Section 1), and is focused on information technology, pharmaceuticals, banking, energy technology, and auto components.^{71 72}

Democracy is strong in India, and the Indian experts with whom the Commission delegation met relished debating current issues. During the Commission’s visit, interlocutors expressed a variety of opinions about the impact of China’s development on Indian economic growth and regional stability. According to one academic, the most positive aspect of Sino-Indian relations is the burgeoning trade relationship, which is projected to reach \$40 billion by 2010.⁷³ However, one economist argued that India’s economic relationship with China is one-sided, and that the nature of trade between China and India is unhealthy for the development of Indian manufacturing. Most Indian exports to China are raw materials, and most imports from China are finished goods. This academic noted that the nature of the economic relationship does not help to enhance and strengthen Indian manufacturing capabilities.

Additionally, as India and China are on a similar trajectory of economic development, they compete for similar products and services in the market. For example, Chinese antibiotics have flooded the Indian market, and several Indian enterprises producing pharmaceuticals have closed because they cannot compete with the prices of Chinese products. However, other experts countered that the quality of Chinese goods is inadequate, and that this has allowed Indian manufacturers to be competitive in the domestic Indian market by providing products of higher quality.

Indian experts agreed that the security relationship with China continues to hold the potential to spoil economic relations between the two nations. As noted above, a deep mistrust of Chinese intentions remains among Indian policymakers stretching back to the 1962 border war. Indians echo frequent U.S. concerns that China’s authoritarian political system, and a lack of transparency in the policy debates and decision-making apparatus of the government and the Chinese Communist Party that controls it, make it difficult to trust and develop a strong cooperative relationship with China. They also prevent India from deeply engaging China on security matters.

Border Dispute

The border conflict over which China and India fought in 1962 remains unresolved, and the line of actual control between India and China is not fully delineated. China and India meet regularly to mediate this dispute, and have agreed on “guiding principles” for resolving it, but have not yet produced a solution.⁷⁴ Chinese and Indian patrols meet face-to-face several times a year, and there is no shared understanding of escalation rules. Thus, there is the potential that a border skirmish can escalate into a wider armed conflict. China claims territories under Indian control, namely the Indian state of Arunachal Pradesh. In November 2006, prior to President Hu Jintao’s visit to India, the Chinese Ambassador to India made a statement in which he called that state part of Chinese territory. China has gone so far as to deny visas to Indians from Arunachal Pradesh on the grounds they are Chinese and therefore do not need a visa to enter China.⁷⁵

According to one former Indian military officer, China is holding this border dispute as a card to play against India, and will use it when it can derive a clear advantage. Another former government official noted that it appeared China was on track to compromise and settle the border dispute in a manner acceptable to India until the Indian government sought stronger ties with the United States. In this official’s opinion, the expansion of the U.S.-Indian relationship caused China to become unwilling to offer concessions. At this point in the relationship, the official noted that both countries refuse to compromise.

China and India as Geopolitical Competitors

China has viewed India as a competitor for influence among developing nations, especially as India’s economic growth has boomed. Cheng Ruisheng, a former Chinese ambassador to India wrote, “In recent years, as the Chinese and Indian economies have developed rapidly and their comprehensive national strength has continually increased, an argument has sometimes appeared . . . that the two powers . . . are bound to clash and a future conflict will be hard to avoid.” However, Cheng argues that the foundation of the Sino-Indian strategic partnership, the Five Principles of Peaceful Coexistence, will prevent this from happening.⁷⁶

Indian security experts believe that China’s objective is to emerge as the leading power in Asia, and competition with India for predominance in the region is a result of this intention. These experts view the direction of China’s military modernization efforts with concern, believing the capacities they see China acquiring will enable China to project power well beyond the Taiwan Strait and into India’s immediate sphere of influence. Dr. Toshi Yoshihara, Associate Professor at the Naval War College, testified to the Commission that China’s focus on certain niche capabilities—for example, its submarine forces—could be the “sharp end of the spear” to penetrate India’s defenses.⁷⁷

China’s military modernization, including improvements in the People’s Liberation Army (PLA) Air Force’s capabilities such as in-flight refueling, and modernization of its air bases in Tibet and Chengdu, has enabled the PLA to shorten the time required to pre-

pare for a major military campaign against India. India also could be threatened by China's movement toward a blue water navy capable of projecting power into the Indian Ocean. Dr. James Holmes, Associate Professor at the Naval War College, testified:

As [China] expands its interests in the Indian Ocean, waging a vigorous soft-power diplomacy and backing maritime aims with material power, China will encounter another rising power—India—that entertains nautical ambitions of its own. Like China, India discerns real, compelling interests in the Indian Ocean, and it enjoys venerable seafaring traditions that offer a major reserve of soft power. Strategists in New Delhi phrase their arguments in intensively geopolitical terms—jarringly so for Westerners accustomed to the notion that economic globalization has rendered armed conflict passé. And the Indian economy has grown at a rapid clip—albeit not as rapidly as that of China—allowing an increasingly confident Indian government to yoke hard power, measured in ships, aircraft, and weapons systems, to a foreign policy aimed at primacy in the Indian Ocean region.⁷⁸

As discussed in Chapter 2, Section 1 (“China’s Military Modernization”) and also in Chapter 3, Section 3 (“The Strategic Impact of China’s Energy Policies and Activities”), China appears to be energetically seeking expansion of its naval presence and reach into the Indian Ocean, with one major motivator being protection of the sea lines of communication (SLOCs) on which it depends for transport of energy resources from the Middle East and Africa to China. Dr. Holmes noted that such movement by the Chinese likely will result in a focus on expanding the PLA Navy’s capabilities for long endurance operations and greater reliance on nuclear submarines.⁷⁹

In addition, the military will seek locations for forward operations. The PLA Navy is establishing relationships with ports throughout the Indian Ocean and Persian Gulf that could be used to support forward operations and protect SLOCs, including ports in Pakistan, Burma, Sri Lanka, and the Maldives; and it also is building what a former Indian military officer termed “strategic land bridges” from strategic port locations, notably in Burma, to China’s inner provinces.

This strategy has been named the “string of pearls,” but as one Indian security expert noted, it does not consist only of establishing military bases and projecting China’s military power, but also includes spreading economic and political influence. According to him, the “string of pearls” consists of economic engagement; supporting critical infrastructure projects such as building ports and pipelines; and becoming involved in regional politics. All these actions together encircle India and limit its influence in South and Southeast Asia. The concept of encirclement or containment is prominent in the minds of India policymakers and media. As one recent article stated, “China has done its own containment strategy—the ‘string of pearls’ India, however, fears that this string of pearls can become an iron necklace around it.”⁸⁰

Commissioners were told in New Delhi that some Indian analysts believe China's involvement in the Shanghai Cooperation Organization and its relations with Pakistan also have as key objectives constraining the development of Indo-Central Asian relations and may be succeeding to some extent. Security experts noted that they have observed China's "unprincipled engagement" with nations in Central, South, and Southeast Asia in which it has offered arms and economic support in exchange for the support of those nations in a geostrategic alignment against Indian regional power.

The immediate and long-term impacts of China's relationships with countries surrounding India are still debated in Indian policy circles. A former military officer stated that without Sino-Indian economic engagement, China's encirclement of India would have become a source of instability on the subcontinent. Other interlocutors noted that some policymakers are willing to balance their concerns about China's activities designed to constrain Indian influence with their desire to foster open trade and economic engagement.

In response to the situation, India is hedging against China's rise to regional dominance while it simultaneously is attempting to maintain its leadership in South Asia and, more broadly, to secure a place as a leader in all of Asia. India has developed a "Look East" policy whose focus is the use of foreign policy instruments to seek mutually beneficial cooperation with other Asian nations, to serve as a leader for struggling democracies in the region, and to offer an alternative to partnering with China. This involves India's participation in various multilateral dialogues such as with the Association for Southeast Asian Nations (ASEAN), and its active pursuit of strong bilateral relations in the region. In a speech in April 2007, Foreign Secretary Shri Shivshankar Menon stated:

As we look forward to an increasing role in global affairs we need to expand our network of international relationships, political engagement, and economic and technical cooperation with the world. We are looking today at expanding circles of engagement, starting with the immediate neighbourhood, West Asia, Central Asia, South-east Asia and the Indian Ocean region.

This is reflected in our political, economic and defence engagement with these regions. Our Look East Policy and the consequent intensified engagement with East and South-east Asia [have] led to the rebuilding of India's historically benign and stabilizing role in these regions premised on the commerce of ideas and goods ... We need to strengthen political, physical, and economic connectivity between India and East Asia and broaden the underpinnings of our quest for peace and prosperity. We are also adding important elements to our traditional ties with countries of the Persian Gulf region by leveraging economic opportunities.⁸¹

Additionally, Dr. Holmes testified:

Indeed, both Indian thinkers and outside observers often speak of an Indian equivalent to the Monroe Doctrine that seeks to place the region off-limits to external politico-military intervention. If intervention is necessary, imply Indian leaders, India should take the lead rather than give outsiders a pretext for doing so. Such a doctrine will inevitably have a strong seafaring component to it. New Delhi has nonetheless signaled its reluctance to allow any outside power to gain territories in the Indian Ocean basin or to police the region—perhaps in search of an excuse for territorial aggrandizement. And India clearly wants the wherewithal to make good on its claim to preeminence in the region, with naval officials openly declaring that the nation needs a blue-water navy to fulfill the missions set forth in India's 2004 Maritime Doctrine.⁸²

Part of India's "Look East" policy that seeks to increase India's diplomacy in Southeast Asia promotes strengthened relations with Burma.⁸³ Both China and India have sought access to Burma's natural gas resources. Burma is expected to announce the winner of a contract to develop the Shwe gas fields in western Burma, and both Indian and Chinese companies have submitted bids.⁸⁴ An Indian security expert told the Commission that Western isolation of Burma requires India to engage in order to hedge against China's increasing its patronage of Burma, and to ensure that China does not lock up Burma's resources. A former Indian government official argued that Burma is vital to India strategically, and that the United States should accept that all countries must have relations for their own strategic reasons, even with nations whose governments the United States finds objectionable.

Ms. Thin Thin Aung, a Burmese activist, testified before Congress in 2006 that "what was once [India's] noble policy towards Burma based on democratic values has been replaced during the last decade by one that marginalizes aspirations for freedom of the Burmese people and our ethnic Nationalists."⁸⁵ This has been observable in India's response to the protests of Burmese citizens against the military regime in September 2007. India's news source *The Hindu* reported that Indian forces on the Indo-Burmese border increased patrols to prevent activists and protesters from escaping into India.⁸⁶ India also publicly opposed the imposition of U.N. sanctions against Burma, stating that it preferred dialogue and diplomacy, and saying that it has "developed a 'useful' relationship with the military regime without giving up on [India's] interests."⁸⁷

Throughout this period, India has not altered its standing policy of investment in Burma's energy sector. India's Petroleum Minister traveled to Burma just days following the protests against the Burmese military regime and massacre of pro-democracy activists, and representatives of the two countries signed three Production Sharing Contracts for natural gas exploration.⁸⁸ Additionally, on October 10, 2007, both countries announced that they will be signing a formal agreement to develop the Sitwee port on the Kaladan

River, allowing India's landlocked states in the northeast access to the Bay of Bengal.⁸⁹

Iran is another relationship of strategic importance for India. In the conduct of its relationship with Iran, India is mindful of its relationship with the United States. In 2003 Iran's President Mohammed Khatami visited India and signed seven accords regarding strategic cooperation, resources management, oil and gas exploration, and trade.⁹⁰ Indian and Iranian armed forces have conducted joint military exercises.⁹¹ The focus of this relationship is access to energy resources. India purchases approximately 7.5 percent of Iran's oil exports.⁹²

Interestingly, India's engagement with Iran has not always created a negative spirit of competition with China; instead it has fostered India-China cooperation. A report prepared for the Commission in 2006 concluded that:

China and India ... are economic powers dependent on cheap Middle East oil. Their interests are in working together with major consumers to keep prices reasonable. To this end, the two states have recently signed an agreement designed to end the "mindless rivalry" over oil. The agreement has established a formal procedure to exchange information about oil development bidding. The agreement may lack teeth, but it demonstrates that two of the world's major consumers have recognized that, as India's petroleum minister put it, "rivalry only benefits those who are selling assets, no matter which country wins."⁹³

The report also noted that from 2005 to 2006 China, India, Russia, and Iran signed energy deals with each other valued at about \$500 billion.⁹⁴

India's energy cooperation with Iran complicates India's policy toward Iran's nuclear program and noncompliance with the International Atomic Energy Agency (IAEA) safeguards and inspections requirements. It also complicates India's relationship with the United States. U.S. law requires sanctions on investments over \$20 million in one year in Iran's energy sector.⁹⁵ From 2004 to 2006, two individuals and four companies from India were sanctioned by the United States under the Iran Nonproliferation Act of 2000.⁹⁶

In January 2006 the U.S. ambassador to India stated that future U.S.-India civil nuclear cooperation was contingent on India's support in the IAEA for the steps the United States took to persuade members of the IAEA to approve the referral of Iran to the Security Council for sanctions.⁹⁷ In addition, the U.S. Congress passed the Henry J. Hyde United States-India Peaceful Atomic Energy Cooperation Act of 2006, declaring that the United States' policy should be to secure India's support for containing and, if necessary, sanctioning Iran for its efforts to develop weapons of mass destruction. At the time this Report is being published, the future of this agreement is uncertain.

The dynamic of China's and India's engagement in the region generates competition for regional influence, which also affects the United States' standing in Asia and the perception by other nations in the region of the United States as an economic and security partner. However, the relationships that China and India have

with Burma and Iran, and the competition of the two giants for energy resources and other interests within Burma and Iran, create a race to the bottom in terms of fostering democratic principles, human rights, and transparent and accountable government.

Academics noted that India also is hedging against the potential collapse of China's internal political and economic system, if the CCP cannot adapt to market forces and societal pressures and overcome the array of increasingly serious challenges it faces in managing the nation and its population. In many meetings with the Commission delegation, Indian interlocutors mentioned the rising internal instability in China and its potential to lead China into either economic collapse or external aggression, each of which may have serious consequences for the United States and India.

India is addressing both these scenarios by diversifying its trade relationships, developing multilateral relationships in the region (such as through participation or observer status in regional organizations), and strengthening bilateral relations with the United States, Japan, Australia, and Taiwan. Additionally, it is promoting its political values as an alternative to China's authoritarian control that is anathema to many in the region.⁹⁸ Experts disagreed as to which strategy would be more effective for Indian foreign policy. Some Indian academics and policy experts noted that India's multilateral engagement, such as the recent Malabar naval exercises with the United States, Australia, Japan, and Singapore, appears to create an Asian bloc against Chinese expansion, and would work against Indian interests by impeding India's ability to develop a positive relationship with China. One former government official specifically argued in support of promoting bilateral relationships instead of multilateral relationships so as to avoid the appearance of ganging up on China. However, other experts countered that multilateral engagement is a sovereign nation's right, and if it benefits India's security interests, then India should proceed without concerning itself about China's reaction.

Tibetan Refugees in India and the Tibetan Government-in-Exile

The presence of Tibetan refugees in India is a sensitive subject in Sino-Indian relations. After China took control of Tibet in 1950, India allowed refugees to enter the country and establish communities in exile. The Dalai Lama escaped to India in 1959 and established the Tibetan Government-in-exile in Dharamsala, approximately 800 miles south of Lhasa, Tibet. Approximately 85,000 Tibetans reside in communities in India, with another 14,000 living in Nepal.⁹⁹ The Commission delegation was told that India allows protests and demonstrations to express Tibetan solidarity and promote human rights, but that the Tibetan exile population, recognizing the sensitive political relationship between India and China vis-à-vis Tibet generally does not directly criticize Chinese policy or otherwise inflict damage or strain on Sino-Indian relations. China continues to use force against Tibetans fleeing China, as demonstrated in October 2006 when Chinese troops fired into a group of Tibetans crossing the Nangpa La pass into Nepal.¹⁰⁰

China is building infrastructure actively in the provinces that border India. For example, in July 2006, China opened a railway connection from Qinghai province to Lhasa. Approximately 30,000 workers, including 10,000 Tibetans, labored to construct the rail line.¹⁰¹ One motivation for this investment appears to be to improve Chinese access to Tibetan natural resources—including water, copper, gold, and chromium. Another motivation is to facilitate the movement of Han Chinese into Tibet. Additionally, China's energy companies are pursuing hydropower projects in Tibet, which potentially could affect the downstream flows of 10 river systems providing water to China, India, Pakistan, Vietnam, Cambodia, Laos, Thailand, Nepal, Bangladesh, Burma, and Bhutan.¹⁰² Perhaps the greatest cause for concern in India about the infrastructure developments on the Chinese side of the border is the recognition that expanded development in the Chengdu and Lanzhou military regions—including the provinces of Tibet, Xinjiang, and Yunnan—could allow Chinese forces to mass troops more quickly in the event of a border conflict with India. Absent a resolution to the long-running border dispute, continued Chinese infrastructure development in Tibet could increase tensions between China and India.

Impact of the Sino-Indian Relationship on U.S.-China Relations and U.S. Strategic Interests in Asia

The impact of the Sino-Indian relationship on U.S.-China relations has economic, security, and geopolitical facets. According to one former Indian government official, Indian foreign policy is reliant upon the nation's relations with the United States, Russia, and China. India wants to minimize contention with China, while at the same time it boosts relations with the United States and Russia to balance China's influence. China recognizes that security along its borders with India is necessary for stability, control of minority populations living in the border areas, and economic development; China also is interested in promoting Sino-Indian relations as a counter to U.S.-Indian relations. Depending on how China and India approach their bilateral trade and security relationship, the result could be enhanced or weakened regional stability.

In the opinion of some Indian security experts, China does not want a conflict on the border because it wants to focus on developing the provinces and maintaining political stability. These experts posited that China may try to avoid a border conflict in order to facilitate development of greater trade linkages between India and some of China's poorest provinces. This would result in greater regional trade integration and the formation of cross-border production networks. A stronger relationship might enable both countries to cooperate willingly to exploit new energy resources in places such as Burma and Iran, and to share technologies to reduce energy demand. Such a course, if it develops, will concern U.S. policymakers because U.S. influence in Asia could be curtailed as China's and India's influence grows. In addition, Indian-Chinese cooperation could facilitate continuation of human rights abuses and conflict in Middle Eastern and Southeast Asian nations—by funding the governments engaged in these abusive activities through the purchase of energy resources, and by selling arms to them.

However, if India perceives that China is succeeding in its efforts to encircle India and to constrain its growth and influence, India could decide to expand controls over trade and investment in an attempt to protect its economy from being undermined by inexpensive Chinese imports. India could be more assertive in its advancement of economic and energy ties around the region, and in its promotion of democracy as an alternative to China's state-led development model. It also could adopt a more aggressive stance on the border issue with China and seek a stronger role in security matters in Asia.

India also could seek a stronger relationship with the United States. Representatives of an Indian think tank who met with the Commission delegation noted their belief that China is suspicious of the United States' relationship with India and is wary of being edged out of Asia by a strong U.S.-India relationship. If the United States and India strengthen their relationship, China in response could work to strengthen ties further with Pakistan and other nations bordering India. China also could attempt to lessen tensions in the U.S.-China relationship in order to foster the image that it is a positive trading partner and diplomatic partner in Asia. Yet, Dr. Jing-dong Yuan from the Center for Nonproliferation Studies writes, "Washington and New Delhi share normative values such as democracy and strategic interests such as terrorism while Beijing's ties with both are more driven by contingent rather than structural interests."¹⁰³

The interplay of Sino-Indian relations will affect not only U.S. bilateral relations with China and India, but also U.S. strategic interests in Asia. Both the United States and India are attempting to hedge against China's rise, and a stronger U.S.-India relationship could serve as a counterweight to China's regional influence. This common interest could facilitate greater cooperation by the United States and India on economic and security issues. For example, cooperation between U.S. and Indian military forces in the Indian Ocean can help to ensure protection of sea lines of communication and the vital resources that transit through them. Opportunities also exist for coordinating humanitarian responses and expanding trade.

Additionally, the United States has an interest in building democracy throughout the region. India, although a democracy, and China appear to have interests that are at odds with this U.S. interest. India's and China's relationships with Iran sustain a regime that is known to support the insurgency in Iraq, and their support of the military regime in Burma and their continued financial investment there undermine Burma's democratic movement. Future cooperation between India and China in Iran and Burma could further stymie U.S. and multilateral initiatives to broaden global democratic governance, secure Iraq, curb Iran's nuclear proliferation, and address the human rights violations in Burma.

Conclusions

- The United States and India share similar concerns about the rise of China, the spread of its influence in Asia and elsewhere around the world, and the security implications of an

emboldened China willing to assert its military power in areas outside its borders and territorial waters.

- Although India does not want to be perceived as “ganging up” against China, it will seek to expand its multilateral relationships to hedge against China’s growing influence and military strength. In part because of this, opportunities exist for U.S.-India cooperation on economic and security matters and in the promotion of democratic values and governance throughout Asia.

SECTION 3: HONG KONG

“The Commission shall investigate and report on—

“REGIONAL ECONOMIC AND SECURITY IMPACTS—The triangular economic and security relationship among the United States, [Taiwan], and the People’s Republic of China (including the military modernization and force deployments of the People’s Republic of China aimed at [Taiwan]), the national budget of the People’s Republic of China, and the fiscal strength of the People’s Republic of China in relation to internal instability in the People’s Republic of China and the likelihood of the externalization of problems arising from such internal instability.

“FREEDOM OF EXPRESSION—The implications of restrictions on speech and access to information in the People’s Republic of China for its relations with the United States in the areas of economic and security policy.”

A delegation of Commission members visited Hong Kong in May 2007 and met with representatives of the Hong Kong government, Legislative Council members, business leaders, representatives of Hong Kong political parties, and democracy activists. In some cases, this Commission report will not attribute statements to individuals to protect their anonymity.

1997–2007: Hong Kong Ten Years after the Handover

On July 1, 1997, the government of the United Kingdom returned control of Hong Kong to the People’s Republic of China (PRC), and the PRC established the Hong Kong Special Administrative Region (HKSAR) as a subordinate unit. This inaugurated an experiment with what has been called a “one country, two systems” arrangement, where HKSAR is permitted to operate for a period of fifty years under a different set of laws, rules, procedures, rights, and responsibilities (an amalgamation of China’s system, the preceding system in Hong Kong under British colonial rule, and some new features) than applies in the PRC.

As the foundation of this new system, Hong Kong’s Basic Law, approved by the PRC’s National People’s Congress in 1994, maintains Hong Kong’s market-oriented economy while at the same time is supposed to move the polity toward a system of universal suffrage (i.e. direct elections in which all citizens have a vote).

There is a substantial difference of opinion among Hong Kong citizens concerning the extent to which the HKSAR government and the PRC government have honored their commitments under

the Basic Law, and the extent to which the “one country, two systems” experiment has been successful. Democracy supporters believe that inadequate and insufficiently rapid progress has been made toward the protection of human rights, universal suffrage, and expansion of other individual political rights, and that the government has been inattentive to the needs of Hong Kong’s citizenry. Individuals considered “pro-Beijing” argue that progress has been substantial and sufficient; that “one country, two systems” has achieved political and, importantly, economic stability; and that further movement toward universal suffrage should only be made taking into account Hong Kong’s special status and with sufficient preparation.

Wu Bangguo, Chairman of the National People’s Congress noted in a speech commemorating the anniversary of the Basic Law that:

Our country is a single-system state, and the high degree of autonomy enjoyed by the Hong Kong SAR is not intrinsic to Hong Kong but was granted by the Central Government. The Central Government may grant those powers that are not clearly stipulated in accordance with the provisions of Article 20 of the Basic Law, and there is no issue of so-called “residual power.” Seen in this light, the Basic Law is a law of authorization. Fully and accurately understanding this point is of the utmost importance in guaranteeing the implementation of the guiding principles of “one country, two systems” and the Basic Law and in correctly handling the relations between the central authorities and the Hong Kong SAR.¹⁰⁴

President Hu Jintao reiterated this principle in his speech commemorating the tenth anniversary of the handover of Hong Kong on July 1, 2007. He stated, “‘One country’ means that we must uphold the power vested with the Central Government and China’s sovereignty, unity, and security. ‘Two systems’ means that we should ensure the high degree of autonomy of the Hong Kong SAR and support the chief executive and SAR Government in exercising government power as mandated by law.”¹⁰⁵

The U.S. Department of State voluntarily submitted a Hong Kong Policy Act Report in June 2007,¹⁰⁶ noting that the discharge of the “one country, two systems” theory has been largely successful, and that “the central government in Beijing has generally respected its commitment . . . to maintain a ‘high degree of autonomy’ for Hong Kong and to preserve and respect the integrity of [Hong Kong’s] distinct economic, legal, and social systems.”¹⁰⁷ However, previous Reports have questioned the strength of Hong Kong’s political autonomy. For example, in 2005, the Report noted that Beijing’s decision to interpret the Basic Law and rule out universal suffrage in 2007 “severely tested” Hong Kong’s political autonomy under this system.¹⁰⁸ In general, past reports acknowledge that Hong Kong’s economic autonomy has remained intact and robust.¹⁰⁹

Chief Executive Selection

The process for selecting Hong Kong's governmental leadership—the Chief Executive and members of the Legislative Council—has been determined by two Annexes to the Basic Law. The Chief Executive is selected by an Election Committee composed of 800 members including, among others, representatives from industry, labor, and religious groups, members of the Legislative Council, and Hong Kong deputies to the National People's Congress. The composition of the Committee is heavily weighted toward business and industry representatives, many of whom rely on strong business ties with the mainland. Each of these constituencies selects its own Committee members.

Table 4.1 Composition of the Hong Kong Election Committee (800 Members) ¹¹⁰

The Functional Constituencies	550 Members
Agriculture and Fisheries	40
Insurance	12
Transport	12
Education	20
Legal	20
Accountancy	20
Medical	20
Health Services	20
Engineering	20
Architectural, Surveying, and Planning	20
Labour	40
Social Welfare	40
Real Estate & Construction	12
Tourism	12
Commercial (First)	12
Commercial (Second)	12
Industrial (First)	12
Industrial (Second)	12
Finance	12
Financial Services	12
Sports, Performing Arts, Culture, and Publication	40
Imports and Exports	12
Textiles and Garments	12
Wholesale and Retail	12
Information Technology	20
Catering	11
Heung Yee Kuk ¹¹¹	21

Table 4.1 Composition of the Hong Kong Election Committee (800 Members) ¹¹⁰—Continued

The Functional Constituencies—Continued	550 Members
The District Councils	42 (21 from Kowloon and HK, 21 from New Territories)
Special Constituencies	114 Members
Higher Education	20
Hotels	11
Chinese Medicine	20
Chinese People's Political Consultative Conference	41
Employers' Federation of Hong Kong	11
Hong Kong Chinese Enterprises Association	11
Government Bodies	96 Members (all ex officio)
National People's Congress	36
Legislative Council	60
Religious Organizations	40 Members
Catholic Diocese of Hong Kong	7
Chinese Muslim Cultural and Fraternal Association	6
Hong Kong Christian Council	7
Hong Kong Taoist Association	6
The Confucian Academy	7
The Hong Kong Buddhist Association	7

Candidates for Chief Executive are nominated by Committee members and must secure support from a minimum of 100 members in order to stand for election.¹¹² If only one candidate is nominated through the nomination process, that candidate receives an official appointment from the PRC government. If multiple candidates are nominated, an election is conducted by the Election Committee, and the winner of that vote receives appointment from the central government. Given the Election Committee's substantial weighting toward business interests that presumably will seek to preserve their own base of power under the current electoral system, it is likely the Committee members will continue to elect the candidate they believe will best serve their interests—Beijing's preferred candidate.

The selection of the Chief Executive did not require elections between 1996 and 2007 because, during this period, only one candidate reached the threshold of 100 nominations each time the Chief Executive was to be selected. However, the March 2007 selection of the Chief Executive was contested. During the December 2006 nomination period, Alan Leong Kah Kit, former chairman of the Hong Kong Bar Association, received 132 nominations from members of the Election Committee, and Donald Tsang, the incum-

bent, received 641 nominations. Having received support for nomination from at least the minimum number of Committee members, both sought support within the Election Committee. This was extended into a campaign for public support.¹¹³

During the campaign, incumbent Chief Executive Tsang agreed to participate in two debates with Mr. Leong, who represented the pro-democracy parties in Hong Kong. The debates occurred on March 1 and March 15, 2007, and reflected the importance of being able to articulate policy positions and respond to questions.¹¹⁴ According to polls conducted by the University of Hong Kong, Mr. Leong's public support increased dramatically after the first debate.¹¹⁵ These debates were watched by over two million people in Hong Kong and, notably, the broadcasts were accessible to viewers in Guangdong Province as well.

On March 25, Mr. Tsang won the election with 649 votes out of 772 cast; Mr. Leong received 123.¹¹⁶ Although Mr. Leong did not win the election, the support he garnered helped to establish a significant precedent and the expectation that future elections for Chief Executive will have multiple candidates, articulated policy platforms, and open debates. Following the election, Mr. Leong stated, "In the past few months we have seen a fundamental change of political culture. There is no turning back from here. Hong Kong people's determination to achieve universal suffrage in 2012 [when the next election for Chief Executive is scheduled to occur] remains as strong as ever."¹¹⁷

An interesting development since the election is that Chief Executive Tsang has tied his policy initiatives to promises made during the campaign period. He explicitly acknowledged this in his annual policy address on October 10 entitled "A New Direction for Hong Kong." Specifically, he discussed policy proposals related to universal suffrage, tax relief, education, social entrepreneurship, and relations with the mainland and, with regard to each area, reiterated what his campaign statements promised.¹¹⁸ The fact that Chief Executive Tsang included such references suggests that competitive elections for the Chief Executive could strengthen the accountability of Hong Kong's government to Hong Kong's citizens. If candidates are, indeed, required to clarify their policy platforms and propose policy reforms, the public would have a benchmark after the election by which to measure the Chief Executive's responsiveness and trustworthiness.

Legislative Council Selection

The Legislative Council currently is comprised of 60 members, each of whom serves for a four-year term. The most recent election was in September 2004, and at that time, 30 members of the council were elected through direct elections and 30 members were elected by functional constituencies.¹¹⁹ Several political parties have members represented in the Legislative Council; 25 members are loosely considered "pro-democracy," and 35 members are loosely considered "pro-Beijing."¹²⁰ Pro-democracy parties include the Democratic Party, the Frontier Party, the Civic Party, and the League of Social Democrats. Pro-Beijing parties include the Liberal Party and the Democratic Alliance for the Betterment and Progress of Hong Kong (DAB).

The next election for the Legislative Council occurs in 2008.

The Role of Political Parties in Hong Kong

In meetings with Hong Kong government representatives, the Commissioners were told there is support for increasing the role of political parties in the political process, through devices such as political appointments to various senior executive positions in the HKSAR government. These appointments would expand the political appointee system from one in which only the highest-level cabinet ministers are appointed, to a system in which political appointments also are made for a number of second- and third-tier executive positions now held by career civil servants. Advocates say this would allow the appointees to gain experience in government administration, and that the Chief Executive would be able through this device to broaden the group of government executives who are dedicated to supporting and implementing the Chief Executive's policy platforms. Given that the current election procedures are weighted toward electing a Chief Executive who is favored by Beijing and is favorable to Beijing's policies, the proposed new system, if implemented, likely will produce a group of subordinate executives and managers who favor the Chief Executive's policies and therefore also view Beijing's policies favorably.

While in Hong Kong, the Commission delegation met with representatives of several political parties. Political party membership in Hong Kong is relatively small; of a total HKSAR population nearing seven million people, the DAB, a pro-Beijing party, has the largest membership with 10,000 members.¹²¹ The DAB is attempting to consolidate its membership in Hong Kong and focus on engaging young people. Hong Kong's pro-democratic parties have fewer members: the Democratic Party has 600 members, and the Civic Party—the party affiliation of unsuccessful Chief Executive candidate Alan Leong—has approximately 700 members.¹²² These membership numbers are not reflective of the support party candidates receive in legislative elections.

Public Participation in Politics

Broadly speaking, Hong Kong residents have become more politically active over the past ten years as opportunities for activism have increased, such as through elections and the expansion of political parties.¹²³ In 2003, Hong Kong District Council elections had an aggregate voter turnout of 44.1 percent, or 2,418,078 voters. In 2004, turnout in the Legislative Council elections for representatives of geographical constituencies was 55.6 percent, or 3,207,227 voters. In both elections, turnout was higher than in previous elections.¹²⁴

Political demonstrations occur regularly. In the first six months of 2005, there were 834 public meetings and processions.¹²⁵ On July 1, 2006, tens of thousands of protesters marched through Hong Kong in support of universal suffrage and labor rights.¹²⁶ On June 4, 2007, tens of thousands of protesters gathered in Hong Kong to mourn those who were killed by the People's Liberation Army in the June 4, 1989, massacre in Tiananmen Square in Beijing.¹²⁷ In addition, many protests are conducted by groups that are outlawed in mainland China, such as the Falun Gong.¹²⁸ While

participation appears to have increased, it also appears that Hong Kong residents have shifted their concerns away from political and human rights issues toward social and environmental issues. When the Commission delegation met with Legislative Council members, they remarked that the environment and pollution in Hong Kong—most of which emanates from mainland sources—is the most active political issue in Hong Kong.

Addressing Universal Suffrage in Hong Kong

One of the most politically charged issues in Hong Kong is the topic of universal suffrage. Under the Basic Law, both the Chief Executive and the Legislative Council are to be selected by election. Article 45 states:

The Chief Executive of the Hong Kong Special Administrative Region shall be selected by election or through consultations held locally and be appointed by the Central People's Government.

The method for selecting the Chief Executive shall be specified in the light of the actual situation in the Hong Kong Special Administrative Region and in accordance with the principle of gradual and orderly process. The ultimate aim is the selection of the Chief Executive by universal suffrage upon nomination by a broadly representative nominating committee in accordance with democratic procedures.¹²⁹

With regard to the legislature, Article 68 of the Basic Law states:

The Legislative Council of the Hong Kong Special Administrative Region shall be constituted by election.

The method for forming the Legislative Council shall be specified in the light of the actual situation in the Hong Kong Special Administrative Region and in accordance with the principle of gradual and orderly process. The ultimate aim is the election of all the members of the Legislative Council by universal suffrage.¹³⁰

While the aim of the Basic Law is to institute universal suffrage, the law itself lacks a timeline for accomplishing that aim. In April 2004 the Standing Committee of China's National People's Congress ruled that the election of the Chief Executive in 2007 and the selection of Legislative Council members in 2008 would not be by universal suffrage.¹³¹ The government argued that the Basic Law provides for selecting the Chief Executive and Legislative Council according to the circumstances in Hong Kong, and the Standing Committee determined that Hong Kong would not be ready for universal suffrage at that time.¹³² Although democracy supporters disagreed with this ruling, Chief Executive Tsang concurred through public statements in 2005 and 2006, indicating that Hong Kong would not move toward universal suffrage in the near future.¹³³

However, in Mr. Tsang's election campaign this year, he promised to resolve the issue of universal suffrage before the end of his current term in 2012, and that his first step would be to issue a "Green Paper" detailing proposals for implementing universal suffrage for both the Chief Executive election and the Legislative Council election. Mr. Tsang honored his commitment and issued

the report, prepared by the Constitutional and Mainland Affairs Bureau, in July 2007. According to Mr. Tsang's plan, the Green Paper underwent a period of public consultation that concluded October 10, 2007. The HKSAR government received public submissions and comments throughout this period.

Senior advisors to Mr. Tsang told the Commission's delegation that he will use public polls to determine which plan for moving toward universal suffrage has the greatest support among Hong Kong citizens, and then he will present that plan to the Chinese government for its approval.

Democratic activists have expressed concern that the pro-Beijing forces in Hong Kong will try to manipulate the polls by the way they present the choices to the public. If they succeed, pro-democratic forces would be placed in the difficult position of either accepting an option that offers less than complete or direct universal suffrage as guaranteed in the Basic Law, or appearing obstructionist to political reforms favored by a majority of Hong Kong's citizens.¹³⁴

The Green Paper on Constitutional Development¹³⁵

The paper presents options on both the structure for implementing universal suffrage and the timeline for implementing such a change. The paper states:

Having regard to the constitutional basis and principles of design of Hong Kong's political structure, as well as the concept of 'universal suffrage' as generally understood internationally, the concept of universal suffrage should include the principles of 'universal' and 'equal' suffrage.

However, there is no single electoral system that suits all places, and that one should not seek to impose any particular political model or electoral system on any place. As far as an individual jurisdiction is concerned, while conforming to the general international understanding of universal suffrage, it can also develop its electoral system having regard to the particular needs and aspirations of its people, the uniqueness of its socio-economic situation, and its historical realities.

For the Chief Executive, the paper suggests different options for the size of the Election Committee and for the number of candidates the committee can nominate. After the nomination of candidates, the paper notes that the Chief Executive then can be selected by "one person, one vote." The Green Paper does not suggest any constitutional changes such as removing the State Council from its role in appointing the Chief Executive after his or her election.

For the Legislative Council, the paper presents options including replacing functional constituency seats with direct election and keeping functional constituency seats but changing the method in which members are selected. Additionally, there are options for phasing in universal suffrage elections for Legislative Council members by abolishing the functional constituency seats incrementally.

The Green Paper on Constitutional Development¹³⁵—
Continued

Other issues in the paper include whether to implement universal suffrage for both the Chief Executive and the Legislative Council at the same time, or whether to institute universal suffrage incrementally. Also, the paper presents options for allowing universal suffrage in 2012, 2017, or after 2017.

The Hong Kong Human Rights Monitor, a non-governmental organization established in 1995 to promote human rights and democracy, submitted a formal commentary on the Green Paper. It expressed concerns that, while a majority of Hong Kong citizens support universal suffrage in 2012 for both the Chief Executive and the Legislative Council, the PRC government and the HKSAR government would not allow this to occur.¹³⁶ It criticized the Green Paper, stating:

*The Green Paper is designed not to facilitate public discussions but to confuse and disinterest the public. Instead of the three integrated options as promised, it only sets out a large number of questions, each with several options, presenting a combination of hundreds of options for the public to consider. It is easy for the public to [lose] focus in such discussion. Obviously, in the light of the majority support for full democracy in the near future, the Government is attempting to use this approach to thin out public support to the numerous different combinations of alternatives to prevent the expression of a clear majority in the public's support for full democracy in the near future.*¹³⁷

The submission also argues that the Green Paper “gives no accurate definition on universal suffrage. It is alarming that the Green Paper even includes retaining functional constituencies in certain forms as an option for the ultimate model for universal and equal suffrage. It reflects a lack of understanding of the true concept of universal suffrage.”¹³⁸

Surveys conducted by the Hong Kong Transition Project¹³⁹ found that in May 2007, prior to the release of the Green Paper, 51 percent of respondents “supported” and 25 percent “strongly supported” direct elections for the Chief Executive.¹⁴⁰ The plurality of respondents (44 percent) supported implementing direct elections for the Chief Executive in 2017, and 16 percent favored implementation in 2012.¹⁴¹ With regard to the Legislative Council, nearly three-fourths supported direct elections for council members, while 16 percent opposed them; 31 percent favored implementing direct elections in 2008 (which the National People’s Congress Standing Committee has ruled will not occur), and 29 percent supported direct elections in 2012.¹⁴²

Beijing has not directly commented on the Green Paper, although representatives have made statements indicating the central government’s preferences. For example, Li Guikang, a deputy director of the Central People’s Government Liaison Office, remarked that “recent survey findings that more than half [of] Hong Kong people

found it ‘acceptable’ if universal suffrage for the chief executive and the legislature could not be achieved in 2012 showed the increasingly ‘rational’ views of the city’s people towards constitutional development.”¹⁴³ His remarks did not cite the source of the information, and they were construed by the public as indicating Beijing’s preference to begin political reforms after 2012. Additionally, at the Asia-Pacific Economic Cooperation (APEC) summit in September 2007, China’s President Hu noted in a conversation with Chief Executive Tsang that the Hong Kong government should “focus on developing the economy while political reform should take place gradually.”¹⁴⁴

A wide range of public responses and editorials to the Green Paper have been published in Hong Kong newspapers articulating both “pro-democracy” and “pro-Beijing” positions. Many acknowledge that the formula selected for achieving universal suffrage must be acceptable to Beijing, which holds the power to approve a timetable and method.¹⁴⁵ Hong Kong government representatives in Washington, DC, indicate that the most debated issue pertaining to the election of the Chief Executive is related to the composition of the Election Committee, and the most debated issue pertaining to election of the Legislative Council members is whether or not to abolish functional constituencies. In general, the Hong Kong government is stressing consensus among the public as a prerequisite for introducing universal suffrage.¹⁴⁶ If no obvious consensus can be achieved, it has been suggested that the issue could be revisited with another public consultation that offers fewer options and simplified choices in an attempt to reach a consensus.¹⁴⁷

Other Significant Issues in Hong Kong

Economic Growth and Competitiveness

While in Hong Kong, the Commission delegation learned that Hong Kong’s economy has recovered from the turmoil of the Asian financial crisis and the economic fallout from the Severe Acute Respiratory Syndrome (SARS) epidemic. Its economy does not appear to have been significantly affected by protests over insufficiently rapid progress toward democratization since the PRC regained political control of Hong Kong in 1997. Importantly, the PRC has not interfered with economic activities in Hong Kong or the relationship of those activities to the global economy, and it is still favored by businesses from all parts of the globe as a center for commerce in Asia, particularly commerce involving the PRC. This has enabled it to remain a key financial center for the Asia-Pacific region. Its gross domestic product (GDP) in 2006 (US\$188.8 billion) increased 6.8 percent over the previous year.¹⁴⁸ Its per capita gross national income (GNI) in 2006 totaled US\$28,460 compared to US\$2,010 in mainland China.¹⁴⁹

In 2003, Hong Kong and China signed the Closer Economic Partnership Agreement (CEPA), a free trade agreement covering trade in goods and services and investment facilitation.¹⁵⁰ The economic integration between Hong Kong and mainland China that followed this agreement has stimulated economic growth, promoted tourism by mainland travelers, and cemented Hong Kong’s role as a facilitator of investments into and out from China.¹⁵¹ Hong Kong

has become one of the world's leaders in initial public offerings (IPOs), and serves as the main offshore listing venue for mainland companies.¹⁵²

According to U.S. government officials in Hong Kong, Hong Kong is losing its status as the leading regional container port to mainland ports. Increasingly, companies located in southern China are shifting their cargo traffic to mainland ports to take advantage of lower transportation costs, cheaper services, and improvements in mainland coastal infrastructure.¹⁵³ Even though Hong Kong's port continues to grow, the ports in Shenzhen and Shanghai are growing at a faster rate, and absorbing new business in the region. This may have unfortunate effects on the United States, because Hong Kong's port has been among the most cooperative participants in the Container Security Initiative (CSI), and likely will be one of the first trial ports for the Secure Freight Initiative to screen shipping containers when it is implemented next year.

The International Monetary Fund notes in its assessment of Hong Kong's economy that price competitiveness has rebounded and is associated with rising economic efficiency from improved labor productivity. However, the growth of Hong Kong's economy is challenged by non-price competitiveness issues related to Hong Kong's aging population, shortages of skilled labor, and concern about rising pollution.¹⁵⁴ As mainland China continues to undergo economic reforms and market liberalization, a future challenge for Hong Kong will be to maintain its role as a broker between mainland businesses and the international business community.¹⁵⁵ In facing this challenge, it has several significant advantages, notably including its reliance on rule of law, buttressed by its independent judiciary, strong record of law enforcement, and transparency.

In October, the government reported that Hong Kong's unemployment rate fell to 4.1 percent, the lowest rate in more than nine years. However, the Commission delegation was told that Hong Kong's income gap is rising; income increases are not always commensurate with employment increases. A recent Oxfam Report found that in 2006, 13 percent of the workforce lived in poverty, earning less than HK\$5,000 a month—half of HKSAR's median income.¹⁵⁶

Energy and the Environment

During the Commission delegation's trip to Hong Kong, delegation members learned that the environment is one of the most potent political issues in Hong Kong, as Hong Kong residents struggle to deal not only with locally-produced air and water pollution, but also with pollution generated in mainland China. In China, enforcement of environmental regulations at the local level remains a major problem, and this has a negative public health impact on both the people in those communities and those who live in other locations affected by the pollution. In interviews with the Congressional Research Service, the American Chamber of Commerce in Hong Kong indicated that air pollution, much of which emanates from China, is a major concern of businesses in Hong Kong,¹⁵⁷ and this concern could affect Hong Kong's attractiveness as an investment location and hub for regional offices. China's Guangdong

Province, adjacent to the HKSAR, is the first province in China to release air quality data, and Hong Kong has established some cooperative efforts with Guangdong to address air and water quality problems.

Another air quality problem unique to this area, identified by Ms. Christine Loh of Hong Kong's Civic Exchange, is the pollution created by ships utilizing the container ports. These ships' emissions remain localized at ground level. Dr. Ng Chonam of the University of Hong Kong also noted that water has become a major issue in all cities in China, including Guangzhou and Hong Kong. During the dry season in Guangzhou, the outflow of the Pearl River diminishes to the point that sea water surges into the delta, harming the water supply and surrounding environment. Hong Kong now imports water from Guangdong province, so this is of concern to Hong Kong as well.

**Pollution Prevention and Energy Efficiency (P2E2)
—Public Facilitation, Private Investment**

Rapid urbanization in the Pearl River Delta (the area of the Chinese mainland adjacent to Hong Kong, including Guangzhou), increased power generation, and an alarming rise in the number of vehicles in the area is causing a dramatic increase in air pollution that has worsened air quality in Hong Kong. In June 2006, the U.S. Consul General in Hong Kong, James Cunningham, stated, "Hong Kong is playing a vital role in the development of mainland China, whose rapid industrialization is lifting millions out of poverty. But in the short space of only a decade, the increased prosperity of the Pearl River Delta has produced the unintended consequence of an air pollution challenge of alarming proportions."¹⁵⁸ Many of the factories and industries in the Pearl River Delta are owned or financed by Hong Kong businesses, many of which "support the global business strategies of U.S. firms."¹⁵⁹ As a result, Hong Kong and the United States have a responsibility to promote cleaner production of energy in Guangzhou, while at the same time encouraging corporate responsibility among businesses that invest in China.

The Pollution Prevention and Energy Efficiency (P2E2) Program was designed to address this problem and was introduced in May 2005 by the commercial staff of the U.S. Consulate in Hong Kong to facilitate Hong Kong-based investment in pollution prevention and energy efficient technologies for industries in the Pearl River Delta. It does not require upfront capital from Chinese industries, and companies pay back investment in cleaner technologies through cost savings on energy. Loan guarantees are provided by the Asian Development Bank (ADB) and credits from the U.S. Export-Import Bank.¹⁶⁰

There are four main steps to the program:¹⁶¹

**Pollution Prevention and Energy Efficiency (P2E2)
—Public Facilitation, Private Investment—Continued**

- A Hong Kong-based environment and energy service company conducts an energy and environmental impact study for a mainland factory, power plant, or real estate development and advises on how to reduce the energy demand and improve the environmental impact through an upgrade in technology.
- The Hong Kong service company secures a loan from a Hong Kong bank to lease or purchase equipment necessary for the upgrade. “The bank would make this loan based on a performance contract and on mainland commercial credit risk, which would be partially alleviated by loan guarantees from ADB or the [U.S. Export-Import] Bank.”¹⁶²
- The loan is repaid with cost savings at the Chinese factory or plant through reduced energy consumption and raw material needs. Cost savings can include reductions of raw materials, water, fuel, waste treatment, and maintenance.¹⁶³
- To monitor the actual cost savings achieved, an independent technical auditor measures and verifies the cost savings in the Chinese factory or plant.

Potential energy savings due to increased energy efficiency can equal up to 50 percent. For example, a medium-sized steel plant in Guangdong consumes 800 gigawatt-hours of electricity costing \$73 million per year. The application of energy efficient technology could produce \$33 million in cost savings, or savings of 45 percent of the annual electricity costs.¹⁶⁴ Additionally, when these loans are applied to the power generation sector in China, the P2E2 program generates emissions credits under the Clean Development Mechanism of the Kyoto Protocol.

Currently, around twenty Hong Kong-based energy and environment service companies are active in this program, seeking mainland partners for assessments and investments. These companies are active in the aluminum, cement, electronics, food processing, iron and steel, power generation, real estate, and textile sectors. The U.S. Commercial Service predicts that this program will expand when the ADB implements US\$1 billion in loan guarantees and loans under its Energy Efficiency Initiative in September 2007, and as the International Finance Corporation fulfills its commitment for US\$300 million in P2E2 support.¹⁶⁵

Freedom of the Press

The nature of the Hong Kong press has changed in the past ten years. Dr. Francis L.F. Lee, professor at the City University of Hong Kong, and Dr. Angel M. Y. Lin, professor at the Chinese University of Hong Kong, write that since 1997 newspapers critical of the Chinese government have moved toward a less critical, more centrist stance, and the “range of ideological viewpoints propounded by the media has been narrowed down.”¹⁶⁶ While Chinese

officials have not openly interfered in the press, journalists and editors have responded to subtle pressures to avoid controversial news by engaging in self-censorship. The 2007 Hong Kong Policy Act Report states that in Hong Kong “a robust dialogue among all concerned parties continues [that] is covered in a largely unfettered press.” However, it goes on, “[a] wide and growing perception exists . . . that much of the Hong Kong press engages in a degree of self-censorship regarding issues sensitive to the PRC central government.”¹⁶⁷

Self-censorship is defined as “a set of editorial actions ranging from omission, dilution, distortion, change of emphasis, to choice of rhetorical devices by journalists, their organizations, and even the entire media community in anticipation of currying reward and avoiding punishment from the power structure.”¹⁶⁸ Self-censorship in Hong Kong occurs by minimizing negative news, especially related to mainland China, and limiting reports that may damage a publication’s economic interests, such as its advertising partners.¹⁶⁹ Additionally, criticisms of the Chinese government are often printed as editorials from individuals outside the news organization, thus reducing the risk to professional journalists.¹⁷⁰ Even among these criticisms, editorials often avoid criticizing Chinese leaders personally.¹⁷¹ The Hong Kong Journalists Association 2007 Annual Report identifies several different types of pressures exerted on journalists that factor into the decision to self-censor. These include political pressure, restrictions on the ability to cover news in the PRC, advertising boycotts, and editorial pressure from within the media organization.¹⁷²

In addition, the arrest and prosecution of journalists is a powerful motivation to self-censor investigations and reporting. In November 2006, a Beijing court upheld a conviction of Hong Kong journalist Ching Cheong, who worked for the Singapore-based *Straits Times*, for selling state secrets to Taiwan.¹⁷³ Mr. Cheong was arrested in 2005 while seeking papers linked to Secretary Zhao Zhiyang,¹⁷⁴ who opposed the Tiananmen massacre in 1989.¹⁷⁵ Mr. Cheong is serving a five-year sentence, and the Hong Kong Journalists Association has been calling for him to be released on medical grounds following reports that his health is failing.¹⁷⁶

Conclusions

- The United States and other democracies, especially in Asia, have a strong interest in the development of democratic freedoms in Hong Kong. Progress toward universal suffrage not only is guaranteed by the Basic Law, but is an important indicator of Beijing’s willingness to fully implement its “one country, two systems” principle. The delay in implementing universal suffrage, and the possibility that the definition of universal suffrage will be altered to include options other than “one person, one vote,” lead to significant concerns that Hong Kong will not achieve the universal suffrage guaranteed in its Basic Law.
- The March 2007 elections for Chief Executive set an important precedent for holding public debates, articulation by candidates of policy positions and goals, and the desire of the people of Hong Kong to have multiple candidates.

- The linkages between China's energy consumption and the pollution affecting Hong Kong provide both incentives and opportunities for increasing investments in clean energy production on the mainland. This can provide an opening for American firms offering clean energy technologies.
- Maintaining an independent, free press in Hong Kong and preventing the causes of self-censorship are necessary for democracy in Hong Kong.

RECOMMENDATIONS

Taiwan

- The Commission recommends that Congress encourage the Administration to continue to work with Taiwan to modernize its military and enhance Taiwan's capabilities for operating jointly with U.S. and allied forces, and make available to Taiwan the defensive weapons it needs for its military forces.
- The Commission recommends that Congress urge the Administration to promote Taiwan's inclusion in international organizations where statehood is not a prerequisite, such as the World Health Organization (WHO).

India

- The Commission recommends that Members of Congress engage in dialogue with members of the Indian parliament on important issues in U.S., India, and China relations.
- The Commission recommends that Congress encourage the Administration to engage in broader and deeper dialogue with the government of India on China's activities and influence in the region.

Hong Kong

- The Commission recommends that Members of Congress, when visiting mainland China, also visit Hong Kong, and that Congress encourage senior Administration officials, including the Secretary of State, to make visits to Hong Kong part of their travel to China.
- The Commission recommends that Congress urge the Administration to maintain a close watch on the development of democratic freedoms in Hong Kong, and formally protest if at any point there is a significant erosion of suffrage, media freedom, or human rights there.
- The Commission recommends that Congress voice its disapproval of the delay in implementing universal suffrage in Hong Kong and the Hong Kong government's consideration of altering the definition of universal suffrage to include options other than "one person, one vote."
- The Commission recommends that Congress reenact the reporting requirements of the Hong Kong Policy Act of 1992, which expired in 2007, that required the Administration to monitor and report on Hong Kong's progress toward universal suffrage, the state of the Hong Kong economy, and the relationship between Hong Kong and mainland China.

ENDNOTES FOR CHAPTER 4

1. Deputy Assistant Secretary of State Thomas Christensen, *A Strong and Moderate Taiwan*, U.S.-Taiwan Defense Industry Conference, September 11, 2007.
2. Freedom House, 2007 Country Report: Taiwan, (Washington, DC: 2007). www.freedomhouse.org/template.cfm?page=22&country=7283&year=2007.
3. U.S. Department of State, 2006 Country Report on Human Rights Practices—China (Taiwan only), (Washington, DC: March 2007).
4. U.S. Department of State, 2006 Country Report on Human Rights Practices—China (Taiwan only), (Washington, DC: March 2007).
5. Taiwan Government Information Office, *Taiwan Yearbook 2006*, (Taipei, Taiwan: 2007), Section 15. www.gio.gov.tw/taiwan-website/5-gp/yearbook/15Society.htm#HumanRights.
6. U.S. Census Bureau, Foreign Trade Division, *Trade in Goods (Imports, Exports, and Trade Balance) with Taiwan*. www.census.gov/foreign-trade/balance/c5830.html#2006.
7. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by an AIT official, August 20, 2007.
8. Jeff Harbee, "There has been a better time for U.S. companies to sell to Taiwan," *Business America*, August 3, 1987. findarticles.com/p/articles/mi_m1052/is_v10/ai_5127993.
9. Institute for International Economics, *Prospects for a U.S.-Taiwan Free Trade Agreement* (Washington, DC: December 2004).
10. 1979 Taiwan Relations Act. www.ait.org.tw/en/about_ait/tra/.
11. Deputy Assistant Secretary of State Thomas Christensen, *A Strong and Moderate Taiwan*, U.S.-Taiwan Defense Industry Conference, September 11, 2007.
12. This joint statement, known as the "two-plus-two" statement, was made following a meeting between senior members of the Japanese and the United States governments in February 2005. The statement suggests that Japan may choose to join the United States in interceding in an armed conflict across the Taiwan Strait.
13. U.S. Department of Defense, *Annual Report to Congress: Military Power of the People's Republic of China*, (Washington, DC: 2007), p. 22.
14. U.S. Department of Defense, *Annual Report to Congress: Military Power of the People's Republic of China*, (Washington, DC: 2007), p. 22.
15. In this statement, President Chen promised: 1) not to declare Taiwan independence, 2) not to change the national title from the Republic of China to the Republic of Taiwan, 3) not to change Taiwan's constitutional relationship with the People's Republic of China, 4) not to promote a referendum on Taiwan independence or unification, and 5) not to abolish Taiwan's National Unification Council (NUC) or National Unification Guidelines (NUG)—institutions designed to negotiate Taiwan's reunification with mainland China.
16. Congressional Research Service, *Taiwan: Recent Developments and U.S. Policy Choices* (Washington, DC: January 2006), p. 6.
17. Congressional Research Service, *Taiwan: Recent Developments and U.S. Policy Choices* (Washington, DC: January 2006), p. 6.
18. BBC News, *Profile: Chen Shui-bian*, November 3, 2007.
19. In Chen's 2000 "Four Noes and One Without" pledge he vowed not to abolish the NUC or NUG. However, on February 27, 2006, President Chen dismantled both, saying that they *will cease functioning and the budget will no longer be appropriated*.
20. Charles Snyder, "Frank Hsieh takes tough line on U.N. bid, cross-Strait issues in Washington," *Taipei Times*, July 25, 2007.
21. U.S.-Taiwan Business Council, *Defense & Security Report: Second Quarter, 2007* (Washington, DC: July 2007), p. 8.
22. "Taiwanese presidential candidate pledges to restore trust with U.S.," *International Herald Tribune*, July 23, 2007.
23. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by Ma Ying-jeou, August 20, 2007.
24. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by Ma Ying-jeou, August 20, 2007.
25. Rich Chang, "'Taiwan Identity' growing: study," *Taipei Times*, March 12, 2006.
26. See China's Anti-Secession Law.
27. See 1979 U.S.-PRC Joint Communiqué (the normalization communiqué).
28. See Chapter Five.
29. Beijing claims that during the 1992 meeting in Hong Kong, Taiwan representatives agreed to China's "One China Principle."

30. Liu Shyh-Fang, *China's Anti-Secession Law*, an event held at the Center for Strategic and International Studies (CSIS), March 21, 2005.
31. Deputy Assistant Secretary of State Thomas Christensen, *A Strong and Moderate Taiwan*, U.S.-Taiwan Defense Industry Conference, September 11, 2007.
32. Shih Hsiu-chuan, "Analysis: Absentee voting needs careful study: analysts," *Taipei Times*, March 30, 2007. www.taipetimes.com/News/taiwan/archives/2007/03/30/2003354483.
33. Murray Scot Tanner, *Chinese Economic Coercion Against Taiwan*, (RAND Corporation: 2007), p. 82.
34. Mainland Affairs Council, *Cross-Strait Economic Statistics Monthly, No. 174*, (Taipei, Taiwan), p. 30.
35. Murray Scot Tanner, *Chinese Economic Coercion Against Taiwan*, (RAND Corporation: 2007), p. 140.
36. U.S. Department of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, 2006*, (Washington, DC: 2006), p. 40.
37. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by Ma Ying-jeou, August 20, 2007.
38. U.S. Department of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, 2006*, (Washington, DC: 2006), p. 37.
39. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, NSC statement made by Secretary General Mark Chen, August 20, 2007.
40. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by Defense Minister Lee Tian-yu, August 22, 2007.
41. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by Defense Minister Lee Tian-yu, August 22, 2007.
42. U.S.-Taiwan Business Council, *Defense & Security Report: Second Quarter, 2007* (Washington, DC: July 2007), p. 12.
43. C4ISR, or 'command, control, communication, computers, intelligence, surveillance, reconnaissance,' lists key facets of a military's capability to obtain and provide to its and allied forces timely information about the location, capabilities, intentions, and actions of opposition and friendly forces to enable it to effectively and rapidly take the most productive steps to prevail against the opponent.
44. Pete Kasperowicz, "Lockheed Martin has 4-month window to secure F-16 sale to Taiwan," *AFX News Limited*, June 19, 2007.
45. Michael Chase, "Taiwan's Han Kuang 23 Military Exercise and the Offensive Counterstrike Debate," *Jamestown Foundation, China Brief*, July 26, 2007.
46. Michael Chase, "Taiwan's Han Kuang 23 Military Exercise and the Offensive Counterstrike Debate," *Jamestown Foundation, China Brief*, July 26, 2007.
47. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by Kuo Lin-wu, August 20, 2007.
48. Port of Kaohsiung Brochure, 2007.
49. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by Port of Kaohsiung Harbor Master Tsai Ding-yi, August 21, 2007.
50. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by an AIT official, August 21, 2007.
51. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by an AIT official, August 21, 2007.
52. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by an AIT official, August 21, 2007.
53. Elizabeth Hague, *Taiwan's Dilemma: A Democracy Divided over National Security*, (Woodrow Wilson Center, Washington, DC: June 2007).
54. Edward Cody, "China's Diplomatic Gain is Taiwan's Loss," *the Washington Post*, July 9, 2007.
55. "UN rejects membership for Taiwan," *BBC News*, September 19, 2007.
56. U.S.-China Economic and Security Review Commission August 2007 Asia Trip, statement made by Taiwan Vice Minister of Economic Affairs Hsieh Fa-da, August 20, 2007.
57. Trade Promotion Authority (TPA) is a program for expediting trade agreements granted by the U.S. Congress to the President. The most recent incarnation of TPA expired on July 1, 2007.
58. Kathrin Hill, "US hits Taiwan hopes of trade pact," *The Financial Times*, May 22, 2007.
59. Michelle Hsu, "FTA is of mutual interest to Taiwan and the U.S.," *China Post*, September 4, 2007.
60. Meetings scheduled with Indian government officials were cancelled at the Indian government's request, due to the political climate at that time.

61. Derek J. Mitchell and Chietigj Bajpae, "China and India," *The China Balance Sheet* in 2007, 152.
62. "Carrying Forward the Five Principles of Peaceful Coexistence in the Promotion of Peace and Development," Speech by Premier Wen Jiabao, June 28, 2004. www.fmprc.gov.cn/eng/topics/seminaronfiveprinciples/t140777.htm.
63. James Barnard, "The China-India Border War," *Marine Corps Command and Staff College*, April, 1984. www.globalsecurity.org/military/library/report/1984/CJB.htm; Sino-Indian War-Dedication, www.globalsecurity.org/military/library/report/1984/CJB.htm; John W. Garver, "China's decision for war with India in 1962," Presentation delivered at Schriffest, November, 2002; www.people.fas.harvard.edu/johnston/garver.pdf.
64. Derek J. Mitchell and Chietigj Bajpae, "China and India," *The China Balance Sheet* in 2007, 153–154.
65. Address by the External Affairs Minister Shri Pranab Mukerjee at a function jointly organized by the Embassy of India in Jakarta and the Indonesia Council on World Affairs on "India's Growing Engagement with East Asia," June 29, 2007.
66. Jing-dong Yuan, "The Dragon and the Elephant: Chinese-Indian Relations in the 21st Century," *The Washington Quarterly*, Summer 2007, 132.
67. "Sino-Indian Trade Hits US\$29.4b, Two Years Ahead of Target," *Xinhua*, January 27, 2007; "Asia Times: India Overtakes Canada in China Trade," *Asia Times*, February 13, 2007. OSC ID: CPP20070214721041. www.opensource.gov.
68. Pallavi Aiyar, "Sino-Indian trade: growing concern," *The Hindu*, August 28, 2007.
69. Pallavi Aiyar, "Sino-Indian trade: growing concern," *The Hindu*, August 28, 2007; "China Set to Become India's Largest Trading Partner in Next Few Years," *The HINDU Survey of Indian Industry 2007*, January 1, 2007. OSC ID: SAP20070721386004. www.opensource.gov.
70. Derek J. Mitchell and Chietigj Bajpae, "China and India," *The China Balance Sheet* in 2007, p. 156; "China Set to Become India's Largest Trading Partner in Next Few Years," *The HINDU Survey of Indian Industry 2007*, January 1, 2007. OSC ID: SAP20070721386004. www.opensource.gov.
71. "China Set to Become India's Largest Trading Partner in Next Few Years," *The HINDU Survey of Indian Industry 2007*, January 1, 2007. OSC ID: SAP20070721386004. www.opensource.gov.
72. By contrast, by the end of 2005, U.S. businesses had invested \$51.1 billion in China and set up 49,000 enterprises in the country.
73. U.S.-China Economic and Security Review Commission, delegation visit to India, August 23, 2007; "China Set to Become India's Largest Trading Partner in Next Few Years," *The HINDU Survey of Indian Industry 2007*, January 1, 2007. OSC ID: SAP20070721386004. www.opensource.gov.
74. "India: PRC 'Will Not Indicate' Reason for Visa Denial to Official from Arunachal," *The Asian Age*, May 30, 2007. OSC ID: SAP20070530377020. www.opensource.gov.
75. "India: PRC 'Will Not Indicate' Reason for Visa Denial to Official from Arunachal," *The Asian Age*, May 30, 2007. OSC ID: SAP20070530377020. www.opensource.gov.
76. "Former PRC Ambassador to India Discusses Sino-Indian Relations in PRC Journal," January 13, 2007. www.opensource.gov.
77. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Toshi Yoshihara, June 14, 2007.
78. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of James Holmes, June 14, 2007.
79. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of James Holmes, June 14, 2007.
80. Indrani Bagchi, "China acquiring muscle in Asia," *Times of India*, September 7, 2007.
81. Ministry of External Affairs, Government of India, "Indian Foreign Secretary Menon Speaks on 'Challenges Ahead' for Foreign Policy," April 10, 2007. OSC ID: SAP20070411384002. www.opensource.gov.
82. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of James Holmes, June 14, 2007.
83. The State Peace and Development Council, the ruling government in Burma, prefers to call the country "Myanmar."

84. Thomas Fuller, "Natural resources abet Myanmar repression," *The International Herald Tribune*, October 2, 2007.
85. U.S. Senate Committee on Foreign Relations, *Hearing on U.S.-Burma Relations*, testimony of Thin Thin Aung, March 29, 2006.
86. "India: Security Forces Step Up Vigil at Burma Border To Stop Infiltration," *The Hindu*, October 11, 2007. OSC ID: SAP20071011428002. www.opensource.gov.
87. "India opposes sanctions in Burma," *PTI News Agency*, October 9, 2007. OSC ID: SAP2007101095001. www.opensource.gov.
88. Subir Bhaumik, "Explaining India's silence over Burma," *BBC News*, September 26, 2007.
89. "Report: India, Burma To Sign Deal Opening Trade Route for Goods to Kaladan Port," *Business Standard*, October 10, 2007. OSC ID: SAP20071010494004. www.opensource.gov.
90. Gopal Ratnam, "Iran, the unmentionable," *Armed Forces Journal*, May 1, 2006.
91. K. Alan Kronstadt and Kenneth Katzman, "*India-Iran Relations and U.S. Interests*," (Congressional Research Service, Washington, DC: August 2006), p. 5.
92. K. Alan Kronstadt and Kenneth Katzman, "*India-Iran Relations and U.S. Interests*," (Congressional Research Service, Washington, DC: August 2006), p. 5.
93. John Keefer Douglas, Matthew B. Nelson, and Kevin Schwartz, *Fueling the Dragon's Flame: How China's Energy Demands Affect its Relationships in the Middle East*, presented to the U.S.-China Economic and Security Review Commission in fulfillment of contractual obligations, September 14, 2006, p. 14.
94. Jehangir Pocha, "Summit Forges Military Ties in Central Asia," *The Boston Globe*, June 18, 2006.
95. K. Alan Kronstadt and Kenneth Katzman, "*India-Iran Relations and U.S. Interests*," (Congressional Research Service, Washington, DC: August 2006), p. 5.
96. "Iran Nonproliferation Act of 2000." www.state.gov/isn/c15234.htm.
97. "U.S. warns India over Iran stance," *BBC News*, January 25, 2007.
98. U.S.-China Economic and Security Review Commission, *Hearing on China's Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China's Energy Use*, testimony of Toshi Yoshihara, June 14, 2007.
99. "Tibet in Exile At a Glance." www.tibet.com/exileglance.html.
100. "Tibetans shot 'in self-defence,'" *BBC News*, October 12, 2006.
101. "Chinese railroad link to Tibet launches," *USA Today*, July 3, 2006.
102. "Damming Asia's watershed: China's hydropower plans in Tibet," *China Energy Weekly*, August 4, 2006.
103. Jing-dong Yuan, "The Dragon and the Elephant: Chinese-Indian Relations in the 21st Century," *The Washington Quarterly*, Summer 2007, 139.
104. "Text of Wu Bangguo Speech at Forum on 10th Anniversary of HK Basic Law," *Xinhua*, June 6, 2007. OSC ID: CPP20070606072003. www.opensource.gov.
105. "SCMP: Hu Jintao's full text of speech to HK people," *South China Morning Post*, July 2, 2007. OSC ID: CPP20070702706017. www.opensource.gov.
106. In 1992, Congress passed the United States-Hong Kong Policy Act, in which the United States agreed to treat Hong Kong as an entity separate from mainland China as long as its political, economic, and trade systems remain autonomous. The act required the Secretary of State to submit an annual report to Congress on the conditions of Hong Kong through the year 2000, and it was amended to extend the reporting requirement through 2006. From 2007, no reporting requirement has been reestablished.
107. U.S. Department of State, *The Hong Kong Policy Act Report*, (Washington, DC: June 2007). www.state.gov/p/eap/rls/rpt/2007/87648.htm.
108. U.S. Department of State, *The Hong Kong Policy Act Report*, (Washington, DC: April 2005). www.state.gov/p/eap/rls/rpt/44543.htm.
109. U.S. Department of State, *The Hong Kong Policy Act Report*, (Washington, DC: April 2005). www.state.gov/p/eap/rls/rpt/44543.htm; U.S. Department of State, *The Hong Kong Policy Act Report*, (Washington, DC: April 2004). <http://www.state.gov/p/eap/rls/rpt/31102.htm>.
110. Hong Kong Election Committee Subsector Elections, "2006 Election Committee Subsector Elections." www.elections.gov.hk/elections/ec2006/en/factsfigures.htm.
111. The Heung Yee Kuk constituency is an association representing indigenous, rural citizens living in Hong Kong's New Territories.
112. Annex I: Method for the Selection of the Chief Executive of the Hong Kong Special Administrative Region, Hong Kong Basic Law.
113. Christine Loh and Carine Lai, *Reflections of Leadership: Tung Chee Hwa and Donald Tsang: 1997-2007*, (Civic Exchange Hong Kong: 2007), p. 182.

114. Christine Loh and Carine Lai, *Reflections of Leadership: Tung Chee Hwa and Donald Tsang: 1997–2007*, (Civic Exchange Hong Kong: 2007), p. 204.
115. Christine Loh and Carine Lai, *Reflections of Leadership: Tung Chee Hwa and Donald Tsang: 1997–2007*, (Civic Exchange Hong Kong: 2007), pp. 205–206.
116. Jimmie Cheung and Denise Hung, “Tsang promises to govern for all; Chief executive secures better-than-expected vote; pledges to strive for universal suffrage,” *South China Morning Post*, March 26, 2007.
117. “Thoughts from the winner and loser,” *South China Morning Post*, March 26, 2007.
118. The Government of the Hong Kong Special Administration Region, Office of the Chief Executive, “The 2007–2008 Policy Address: A New Direction for Hong Kong,” October 10, 2007. www.policyaddress.gov.hk/07-08/eng/docs/policy.pdf.
119. Hong Kong Legislative Council, “History of the Legislature.” www.legco.gov.hk/english/index.htm.
120. Michael F. Martin, *Hong Kong: Ten Years After the Handover*, (Congressional Research Service, Washington, DC: June 2007), p. 13.
121. Michael F. Martin, *Hong Kong: Ten Years After the Handover*, (Congressional Research Service, Washington, DC: June 2007), p. 12.
122. Michael F. Martin, *Hong Kong: Ten Years After the Handover*, (Congressional Research Service, Washington, DC: June 2007), p. 13.
123. Michael F. Martin, *Hong Kong: Ten Years After the Handover*, (Congressional Research Service, Washington, DC: June 2007), p. 4.
124. Hong Kong Elections Committee Subsector Elections, “Growth in Overall Turnout Rate.” www.elections.gov.hk/elections/dc2003/english/rate/rate_giotr.html; Hong Kong Elections Committee Subsector Elections, “Turnout Rate.” www.elections.gov.hk/elections/legco2004/english/turnout/ttgc_overall.html.
125. U.S. Department of State, *The Hong Kong Policy Act Report*, (Washington, DC: April 2006). Updated figures on public participation are not available in the 2007 Hong Kong Policy Act Report.
126. U.S. Department of State, *The Hong Kong Policy Act Report*, (Washington, DC: June 2007). www.state.gov/p/eap/rls/rpt/2007/87648.htm.
127. Anita Chang, “Tiananmen Square survivors seek reform,” *Associated Press*, June 5, 2007. www.nexis.com/new/results/docview/docview.do?risb=21_T2337375504&format=GNBFI&sort=RELEVANCE&startDocNo=1&resultsUrlKey=29_T2337365815&cisb=22_T2337365814&treeMax=true&treeWidth=0&csi=138211&docNo=9&hitNo=ORIGHIT_16.
128. Michael F. Martin, *Hong Kong: Ten Years After the Handover*, (Congressional Research Service, Washington, DC: June 2007), p. 16; U.S. Department of State, *The Hong Kong Policy Act Report*, (Washington, DC: April 2006).
129. Article 45, Hong Kong Basic Law. www.info.gov.hk/basic_law/fulltext/content0204.htm.
130. Article 68, Hong Kong Basic Law. www.info.gov.hk/basic_law/fulltext/content0204.htm.
131. People’s Republic of China Tenth National People’s Congress, “Decision of the Standing Committee of the National People’s Congress on issues relating to the methods for selecting the Chief Executive of the Hong Kong Special Administration Region in the year 2007 and for forming the Legislative Council of the Hong Kong Special Administrative Region in the year 2008,” April 26, 2004; Michael F. Martin, *Hong Kong: Ten Years After the Handover*, (Congressional Research Service, Washington, DC: June 2007), p. 6.
132. Frank Ching, “Election Fever: A Major Event in Hong Kong’s Political Evolution,” *Brookings Northeast Asia Commentary*, April 2007; People’s Republic of China Tenth National People’s Congress, “Decision of the Standing Committee of the National People’s Congress on issues relating to the methods for selecting the Chief Executive of the Hong Kong Special Administration Region in the year 2007 and for forming the Legislative Council of the Hong Kong Special Administrative Region in the year 2008,” April 26, 2004.
133. Frank Ching, “Election Fever: A Major Event in Hong Kong’s Political Evolution,” *Brookings Northeast Asia Commentary*, April 2007.
134. Philip Bowring, “Hong Kong’s Latest Democracy Fraud,” *Asia Sentinel*, July 13, 2007.
135. Government of the Hong Kong Special Administrative Region, *Green Paper on Constitutional Development*. www.cmab-gpcd.gov.hk/doc/GPCD-e.pdf.
136. The HK Human Rights Monitor noted in its submission that an October 8, 2007 public poll by the Public Opinion Programme at the University of Hong Kong found that 58 percent of respondents supported universal suffrage in 2012 for the election of the Chief Executive, and that 67 percent of respondents supported universal suffrage in 2012 for the Legislative Council elections.

137. "Submission to the Constitutional and Mainland Affairs Bureau on Green Paper on Constitutional Development," submitted by Hong Kong Human Rights Monitor, October 10, 2007, p. 2.

138. "Submission to the Constitutional and Mainland Affairs Bureau on Green Paper on Constitutional Development," submitted by Hong Kong Human Rights Monitor, October 10, 2007, p. 3.

139. The Hong Kong Transition Project, headquartered at Hong Kong Baptist University, is a long-term project studying the transition of Hong Kong citizens from being British subjects to being HKSAR citizens. The project began in 1989, and has conducted a series of studies and reports on Hong Kong's political transition.

140. Hong Kong Transition Project, *Hong Kong SAR: The first 10 years under China rule*, a report commissioned by the National Democratic Institute, June 2007, p. 78.

141. Hong Kong Transition Project, *Hong Kong SAR: The first 10 years under China rule*, a report commissioned by the National Democratic Institute, June 2007, p. 79.

142. Hong Kong Transition Project, *Hong Kong SAR: The first 10 years under China rule*, a report commissioned by the National Democratic Institute, June 2007, pp. 82–83. www.accessdemocracy.org/library/2165_hk_transition_project_report_060107.pdf.

143. Klaudia Lee, "Strongest hint yet by Beijing on suffrage; Official appears to rule out 2012," *South China Morning Post*, August 23, 2007.

144. Ng Tze-wai and Denise Hung, "Growth before political reform, Hu tells Tsang; Beijing urges economic focus," *South China Morning Post*, September 10, 2007.

145. For example, see Joseph Cheng Yu-shek, "Over the top," *South China Morning Post*, July 17, 2007.

146. Ambrose Leung, "Talks on suffrage should start only after 2017: Beijing loyalists," *South China Morning Post*, August 16, 2007.

147. Discussions with representatives of the Hong Kong Economic and Trade Office, August 29, 2007.

148. U.S. Department of State, Bureau of East Asian and Pacific Affairs, "Background Note: Hong Kong," July 2007. www.state.gov/r/pa/ei/bgn/2747.htm.

149. World Bank, *World Development Indicators database*, April 2007. Hong Kong economic data at devdata.worldbank.org/external/CPProfile.asp?PTYPE=CP&CCODE=HKG. China economic data at devdata.worldbank.org/external/CPProfile.asp?PTYPE=CP&CCODE=CHN.

150. Henry S. Gao, "The Closer Economic Partnership Arrangement (CEPA) between Mainland China and Hong Kong—Legal and Economic Analyses," *Trading Arrangements in the Pacific Rim: ASEAN and APEC*, (Oceana Publications: September 2004), accessed from Social Science Research Network. www.ssrn.com.

151. U.S. Department of State, *The Hong Kong Policy Act Report*, (Washington, DC: June 2007). www.state.gov/p/eap/rls/rpt/2007/87648.htm.

152. International Monetary Fund, "People's Republic of China—Hong Kong Special Administrative Region: Selected Issues," November 30, 2006, p. 34. www.imf.org/external/pubs/ft/scr/2007/cr0704.pdf.

153. Patrick L. Smith, "Mainland rivals push Hong Kong port into crisis," *International Herald Tribune*, June 22, 2006. www.ihf.com/articles/2006/06/22/business/ships.php.

154. International Monetary Fund, "People's Republic of China—Hong Kong Special Administrative Region: Selected Issues," November 30, 2006, pp. 20–29. www.imf.org/external/pubs/ft/scr/2007/cr0704.pdf.

155. International Monetary Fund, "People's Republic of China—Hong Kong Special Administrative Region: Selected Issues," November 30, 2006, p. 38. www.imf.org/external/pubs/ft/scr/2007/cr0704.pdf.

156. "Workers in poverty on increase in HK," *Chinadaily.com.cn*, September 25, 2007. www.lexisnexis.com.

157. Michael F. Martin, *Hong Kong: Ten Years After the Handover*, (Congressional Research Service, Washington, DC: June 2007), p. 28.

158. "Taking Action on Pollution," Remarks by U.S. Consul General James B. Cunningham before the Hong Kong General Chamber of Commerce and the American Chamber of Commerce, June 6, 2006.

159. "Taking Action on Pollution," Remarks by U.S. Consul General James B. Cunningham before the Hong Kong General Chamber of Commerce and the American Chamber of Commerce, June 6, 2006.

160. "Taking Action on Pollution," Remarks by U.S. Consul General James B. Cunningham before the Hong Kong General Chamber of Commerce and the American Chamber of Commerce, June 6, 2006.

161. "Taking Action on Pollution," Remarks by U.S. Consul General James B. Cunningham before the Hong Kong General Chamber of Commerce and the American Chamber of Commerce, June 6, 2006.

162. "Taking Action on Pollution," Remarks by U.S. Consul General James B. Cunningham before the Hong Kong General Chamber of Commerce and the American Chamber of Commerce, June 6, 2006.

163. "Pollution Prevention & Energy Efficiency (P2E2) Business Model for Hong Kong and China," Presentation by Steward J. Ballard, Chief Commercial Consul, U.S. Commercial Service, February 12, 2007.

164. "Pollution Prevention & Energy Efficiency (P2E2) Business Model for Hong Kong and China," Presentation by Steward J. Ballard, Chief Commercial Consul, U.S. Commercial Service, February 12, 2007; "Taking Action on Pollution," Remarks by U.S. Consul General James B. Cunningham before the Hong Kong General Chamber of Commerce and the American Chamber of Commerce, June 6, 2006.

165. "Pollution Prevention and Energy Efficiency (P2E2)." www.buyusa.gov/hongkong/en/about_p2e2.html.

166. Francis L.F. Lee and Angel M.Y. Lin, "Newspaper editorial discourse and the politics of self-censorship in Hong Kong," *Discourse and Society*, vol. 17, no. 3 (2006), 332–333.

167. U.S. Department of State, *The Hong Kong Policy Act Report*, (Washington, DC: June 2007). www.state.gov/p/eap/rls/rpt/2007/87648.htm.

168. Francis L.F. Lee and Angel M.Y. Lin, "Newspaper editorial discourse and the politics of self-censorship in Hong Kong," *Discourse and Society*, vol. 17, no. 3 (2006), 333.

169. Lewis Macleod, "Analysis Hong Kong Journalists' Body Reviews Press Freedom Since Handover," *BBC*, July 10, 2007; The Hong Kong Journalists Association, "Shrinking Margins: Freedom of Expression in Hong Kong since 1997: 2007 Annual Report," July 2007, pp. 18–23. www.hkja.org.hk/Host/hkja/UserFiles/File/annualreport/e_annual_report_2007.pdf.

170. Francis L.F. Lee and Angel M.Y. Lin, "Newspaper editorial discourse and the politics of self-censorship in Hong Kong," *Discourse and Society*, vol. 17, no. 3 (2006), 334.

171. Francis L.F. Lee and Angel M.Y. Lin, "Newspaper editorial discourse and the politics of self-censorship in Hong Kong," *Discourse and Society*, vol. 17, no. 3 (2006), 353.

172. The Hong Kong Journalists Association, "Shrinking Margins: Freedom of Expression in Hong Kong since 1997: 2007 Annual Report," July 2007, 18–23. www.hkja.org.hk/Host/hkja/UserFiles/File/annualreport/e_annual_report_2007.pdf.

173. Jim Yardley, "Beijing court upholds spying conviction against Hong Kong journalist," *International Herald Tribune*, November 24, 2006.

174. Zhao Zhiyang was former general secretary of the Chinese Communist Party, and had been slated to succeed Deng Xiaoping until he opposed the use of force against protesters in Tiananmen Square.

175. "China blamed for jailing reporter," *BBC*, August 31, 2006.

176. Klaudia Lee, "Release Ching Cheong before he gets cancer, supporters urge," *South China Morning Post*, August 26, 2007.

CHAPTER 5

CHINA'S MEDIA AND INFORMATION CONTROLS—THE IMPACT IN CHINA AND THE UNITED STATES

“The Commission shall investigate and report on—
“FREEDOM OF EXPRESSION—The implications of restrictions on speech and access to information in the People’s Republic of China for its relations with the United States in the areas of economic and security policy.”

Mao Zedong said that maintaining control over information is as important to ensuring continuation of communist rule as maintaining control over the army.¹ This belief still permeates the government of the People’s Republic of China. The obsession with controlling information is one of the cornerstones of China’s internal security strategy. In practice, it seeks to suppress public awareness of endemic corruption, income inequality, growing social instability, democratic ideals that are emerging in some places despite the Chinese Communist Party’s (CCP) efforts to extinguish them, and human rights violations committed by the government. Beijing hides these issues and substitutes messages that attempt to repress dissent and maintain control.

The Chinese government accomplishes this through a carefully crafted system whereby it owns and controls many of China’s media outlets, and oversees the content delivered by the remaining media outlets in China. Under the direction of the Politburo and the government’s Central Propaganda Department (CPD), China’s journalists and editors at every media level are instructed to avoid issues deemed “sensitive” by Chinese leaders, and instead are encouraged to paint positive pictures of life in China. Additionally, those foreign publications and websites that are permitted access to the Chinese market must avoid topics the Party has forbidden.² Special filters are used to block Internet messages containing “undesirable” information and to keep Chinese users away from “unhealthy” foreign websites such as *The New York Times*, Human Rights Watch, and this Commission’s website. Tens of thousands of “Internet police” monitor user activities and online content within China.

These controls foster self-censorship among media professionals and Internet users throughout China. The government punishes journalists and bloggers who publish materials that violate Beijing’s often ill-defined standards. The lack of clear rules combined

with harsh punishments for violations often has the desired effect of prompting journalists and individuals to steer clear of any potential trouble.³ An anonymous Chinese journalist recently said in reference to his plans to write about the 2008 Olympic Games in Beijing, “If something really bad happens and if I get into some [political] power struggle [via my reporting] without knowing it and they need a scapegoat, I could be it.”⁴ Beijing’s capacity to instill fear and apprehension among journalists and Internet users is one effective tool to limit the free and open flow of information within China’s borders.

Beijing’s information controls also directly influence the perspectives and wellbeing of those living in other countries. By suppressing information that Chinese leaders see as politically injurious or threatening to their ability to maintain public order domestically, Beijing is able to influence what news of occurrences in China reaches international media, and thus is able to influence its international image. A general lack of transparency has prevented people and governments around the world from receiving important and time-sensitive information about dangerous food and consumer products and the outbreak of dangerous diseases.

Perception Management in China

Information controls help the CCP perpetuate its political monopoly at the expense of the human rights and political freedoms of the Chinese people.⁵ According to the Committee to Protect Journalists, an independent, nonprofit organization that promotes press freedom and defends the rights of journalists, “Beijing’s media policies under the Hu government are designed to serve two main goals. The first is to maintain the hegemony of the CCP. The second is to control the very real threat of widespread social unrest as the party’s economic and governance policies bring uneven development across the country, and the gap between the wealthy and the poor widens.”⁶

The Chinese constitution affords Chinese citizens both freedom of speech and freedom of the press. However, it also contains language that the state uses to justify restrictions of these freedoms on matters related to “the security, honor, and interests of the motherland.”⁷ Media regulations are left intentionally vague and authorities hold the ability to interpret them at their own discretion. Authorities often arrest reporters and bloggers by citing ambiguous state secrets laws.

China’s controls have influenced the Chinese people’s perceptions of a variety of issues, including national identity; poverty and income inequality; food and product safety; domestic and international affairs; Chinese history; China’s political leadership; Taiwan; and the United States. They also have succeeded in muffling potential political challengers. Controlling the information the populace receives on these subjects allows Beijing considerably greater leeway to take actions and implement policies without having to contend with a negative reaction from China’s people, or at least significantly diminishes any negative reaction it must face.

In recent years, China’s rural-urban income inequality has grown and the rural population has been subjected to a multitude of prob-

lems including pollution, inadequate health care, and abusive labor practices. As a result, riots and demonstrations have increased. Beijing often has suppressed such information. The Committee to Protect Journalists reports that a “policy of enforced silence has come to define the central government’s approach to widespread rural unrest, China’s most salient domestic issue.”⁸

Manipulation of the Chinese public’s perceptions of historical events, national identity, and foreign relations begins during early school years, when schools often teach propaganda in place of factual lessons, according to Ms. He Qinglian, a senior researcher for Human Rights in China. Inculcation of propaganda continues at the university level where only Party-approved textbooks are used to educate China’s future leaders. During a phone interview, Ms. He discussed her own experience as a Chinese professor. She described having to worry constantly about “secret informants” embedded in the student body who report to authorities any deviation from her state-sanctioned lesson plan.⁹

Beijing places restrictions on the foreign media allowed in China and insists that all domestic news sources rely on the state-controlled *Xinhua News Agency* for their international content.¹⁰ Because of this, Beijing is able effectively to portray foreign people and governments in whatever way is most useful to the regime. Propaganda also is used to bolster feelings of xenophobia among the Chinese people by “smearing” some foreigners as troublemakers and enemies. According to Dr. Andrew Nathan of Columbia University, this often is done to engineer a “public mood” that protects the CCP from externally-influenced, so-called “color revolutions” or “flower revolutions” (such as the Orange Revolution in Ukraine and the Tulip Revolution in Kyrgyzstan).¹¹

U.S.-China relations are seriously affected by the CCP’s ability to shape the views of China’s citizens by determining what they see and cannot see in the Chinese media. According to Mr. William Baum, Voice of America’s (VOA) China Branch Chief, “There are very clear efforts to portray the United States as, I don’t want to say an enemy, but as an antagonist, whether it’s over the issue of Taiwan or Tibet or Iraq.”¹² The ultimate outcomes of these smear campaigns have less obvious implications as well as those that are immediately apparent. Scholars have expressed concern that high levels of Chinese nationalism may prevent Beijing from engaging effectively in productive dialogues on important international issues. Mr. Baum explained that the Chinese government is fostering a sentiment that could backfire and force authorities to act in ways that could seriously damage their relationships with foreign countries.¹³

Restrictions on Subjects Deemed ‘Sensitive’

In 2006 the Chinese Communist Party formally endorsed a new political doctrine proposed by China’s President Hu Jintao for the creation of a “Harmonious Society” in China. One aspect of this doctrine is to suppress complaints about the CCP. This new initiative is intended to alleviate growing social tensions in China resulting from rising levels of income inequality and decay of China’s social security system.¹⁴ The programs emanating from the new doc-

trine reinforce China's already-tight controls on information. Reporters Without Borders, an international advocacy group for journalists and media freedom, reports that the PRC government is using the new initiative to reinvigorate its control over information in China.¹⁵

Many had hoped that the PRC government would reverse or at least soften many of these controls in the period preceding and during the 2008 Olympic Games that Beijing is hosting. While the government temporarily has eased the restrictions that foreign journalists will face during this period,¹⁶ the policies do not apply to domestic media. The Council on Foreign Relations warns that "the laws 'will be rescinded if they're seen as jeopardizing the Communist Party's hold on power,' particularly if the openness inspires Chinese journalists to seek greater freedoms themselves."¹⁷

The PRC government currently defines a number of issues as off-limits to media professionals and the online community. These include the Tiananmen massacre, Falun Gong, Taiwan independence, democracy, worker unrest, various human rights issues, and many others. The leadership believes that failure to maintain uniform perspectives among China's people on these core subjects could undermine the CCP's credibility and control.

On most topics it considers sensitive, the CCP effectively has communicated to journalists and Internet users that the only legitimate perspectives are those it approves. However, Beijing also works to control public discourse on a second set of subjects. This second set of issues changes constantly, and is often the product of current events and social developments at the international, national, and local levels. Because of this, it often is difficult for media professionals to know when they are violating the government's restrictions. For example, many Chinese journalists who believed it was acceptable to report on the recent surge of unsafe food and consumer goods in China later received heavy-handed treatment by authorities. During his testimony to the Commission, Mr. Dan Southerland, Vice President of Programming and Executive Editor of Radio Free Asia (RFA), discussed the difficulties these journalists faced, and described how authorities did not tell them that their stories concerning the problems with food and consumer goods were off limits at the time they were written, but later the journalists found themselves in trouble. Keeping tabs on this second set of issues can be a major challenge to Chinese media professionals, and this has contributed to the growth of self-censorship among many journalists.

A clearer picture of this second set of sensitive subjects can be found by reviewing the list of topics the PRC government bans from China's Internet. Mr. Xiao Qiang, an Adjunct Professor at the University of California/Berkeley's School of Journalism, testified before the Commission that lists of the keywords that China-based Internet search engines use to block search results have been acquired by Chinese hackers. According to Mr. Xiao, the lists were dominated by words referencing current affairs. Mr. Xiao elaborated: "What are these words? Yes, they are Falun Gong. Yes, they are Taiwan, Tibet, [and] Tiananmen. [But they are] more than that, most of them are [related to] political and current affairs. . . . Most of them are about the 17th Party Congress and high politics

and . . . leaders' names. [Censors] want to make sure there's no uncontrolled information [about these issues] going around on the Internet."¹⁸

The CCP seeks to control the treatment of any subject that potentially could undermine its authority. Several panelists who testified at the Commission's July 31, 2007, hearing on Access to Information in the People's Republic of China testified that China is intensifying rather than weakening these controls as China's economy grows larger. According to Marquette University Professor Barrett McCormick, "In recent years, the control has been further reinforced for fear of losing power. . . . China has now entered into a stage with higher and higher social tension because of rampant corruption of officials and of harder living conditions of the majority of the population. . . . [China's] government sees any criticism or negative news report as a threat to its rule and has tried every method to block dissemination of such information in order to prevent societal collective action."¹⁹

China's Domestic Control of Information

The PRC government has established a group of agencies that work together to manage China's media content. This network oversees every aspect of China's media—from television and radio to newspapers and the Internet—and operates under the explicit direction of the Politburo. This group of agencies is practiced and proficient in its censorship function.²⁰

Journalists are subjected to a number of control mechanisms. Most Chinese reporters are required to participate in mandatory training sessions to indoctrinate them with political propaganda. If they do not attend, their reporting licenses are not renewed. "Propaganda Circulars" prepared by the Central Propaganda Department (CPD) are distributed to all media outlets in China to instruct editors and reporters how to handle developing issues and sensitive topics in their news stories. Dr. Ashley Esarey, a Professor at Middlebury College, testified to the Commission that these circulars previously were distributed to news bureaus by fax but now are being sent anonymously directly to editors' and reporters' cell phones via text message.²¹

Beijing ensures widespread compliance with its media controls by imposing penalties on violators, some of them severe. According to Reporters Without Borders, "at least 31 Chinese journalists were in jail as of 1 January 2007."²² Other punishments include fines, demotion or dismissal, and criminal prosecution for libel. It also has been reported that some journalists have been beaten for their coverage of sensitive issues.²³ Adherence to the government's rules and proscriptions is rewarded with bonuses and promotions. These financial incentives are very important to most journalists as their regular salaries typically are very small. Dr. Esarey reports that "data from interviews suggest [that] bonuses make up roughly 20 percent of [journalists'] total salary."²⁴

In concert, these policies foster a pervasive and effective culture of self-censorship. In every part and at every level of China's information industries, "carrots and sticks" are sufficiently developed to ensure that employees know what issues are not to be touched or

are to be addressed in only certain ways, what the rewards are for complying, and what the punishments are for crossing the line.

At the top of the government's censorship network sits the CCP Chairman, the President, and the Politburo Standing Committee member responsible for media. They jointly lead an institution known as the "Thought Small Working Group."²⁵ According to Dr. Esarey, this group formulates core policies on information control and appoints the head of the Party's CPD²⁶ that is responsible for implementing guidelines established by this working group and is the central organization in China's information control regime.

The General Administration of Press and Publications (GAPP) and the State Administration of Radio, Film, and Television (SARFT) are the two primary censorship bodies subordinate to the CPD. These two institutions ensure that media content is consistent with the guidelines and doctrine approved by the Thought Small Working Group. According to the Council on Foreign Relations, "GAPP licenses publishers, screens written publications (including those on the Internet), and has the ability to ban materials and shut down outlets. SARFT has a similar authority over radio, television, film, and Internet broadcasts."²⁷

Reinforcing these state institutions is a hierarchy of Party members embedded in China's media. These Party members, each beholden to his or her superior, reflect the policies and instructions of SARFT, GAPP, and others in the areas of their responsibility and influence within their own organizations. "The principal mechanism for forcing media organizations to comply with CCP wishes is the vertically organized nomenklatura system of appointees granting the party power to hire and fire party leaders and state officials, including those of the media industry and top media managers,"²⁸ writes Dr. Esarey. This network goes beyond official state institutions and is manifest in many media outlets. Loyal, compliant editors and producers often are promoted to more senior positions, and some move back and forth between GAPP, SARFT, CPD, and state-run media outlets in a Chinese media version of the revolving door.

China's Internet is governed by many of the same institutions as govern the mass media. SARFT and GAPP both have jurisdiction over online content and can venture into cyberspace when appropriate. However, the online environment presents a large and unique challenge to Chinese censors and therefore it is regulated differently.

Physical access to the Internet is managed by China's Ministry of Information Industry (MII). The Open Net Initiative reports that the MII is the main regulator of the telecommunications sector. A small group of Internet access providers, and a routing system that takes all Chinese Internet traffic through three portals,²⁹ give policymakers in Beijing complete control over how data flow into and out of China. This allows the MII to install hardware and software components that block a variety of external information defined as undesirable—or, according to the Beijing government, "unhealthy." This system is known collectively as the "Great Firewall of China."

In addition to keeping specified information out of China's Internet, the state monitors what users say and do while inside Chinese cyberspace. "China's legal control over Internet access and usage is

multilayered and achieved by distributing criminal and financial liability, licensing and registration requirements, and self-monitoring instructions to non-state actors at every stage of access, from the [Internet service provider] (ISP) to the content provider and the end user.”³⁰ This means that every computer user, website, Internet café, and ISP is compelled not only to self-censor, but also to report on the proscribed activities of others and thereby to act as “cybercops” on behalf of the government.

China also employs an unknown number of “Internet Police” at the central and local levels. While some estimates place this force at 30,000 people, Mr. Xiao estimates that the total number is actually higher.³¹ Dr. Esarey and Mr. Xiao both insist that “wherever there’s an Internet connection [in China], there’s Internet police,”³² and that every city in China has a department dedicated to monitoring local online content. For example, Shenzhen, an average sized city by Chinese standards, had 137 Internet police monitoring local online content two years ago. Dr. Esarey explains that, “if you estimate [that] there are 300 large cities in China and [that] there are 100 police per city, that will get you somewhere in the ballpark of ... the estimated figure.”³³ Mr. Xiao further supports his claim by saying: “[If you] search ‘Internet police’ as a Chinese phrase on the Chinese Internet, you’ll get millions of pages. They don’t hide themselves these days.”

Information Controls Protect Privilege

At first glance, the CCP’s policies on information control may seem to serve no purpose other than to preserve its monopoly on power. However, there is another important motive. New actors who have benefited enormously from China’s economic growth over the last several decades now depend on China’s political system to maintain their new-found power and prosperity. This new group has a direct interest in maintaining the stability of China’s “crony capitalism.” The newly wealthy who have depended on the corrupt system now encourage the CCP’s use of information controls to maintain stability of the Party and its system of handing out favors to a select few.

According to VOA’s Mr. Baum, “the rising power class” in China frequently consists of Party members or business people who are connected to the Party in some fashion and rely on the system to prosper. “They’re affluent and they’re well connected, and they’re the ones who are concerned about maintaining stability.”³⁴ Dr. McCormick concurs, saying that “the bad news from China is [that] some of the wealthiest people are some of the most resistant to the idea of democratization.”³⁵ Furthermore, “contemporary China tells us that democracy needs capitalism more than capitalism needs democracy.”³⁶ Mr. Jiao Guobiao, former deputy professor at Beijing University’s Center for Media and Communications Studies,³⁷ included the following statement in the publication *Declaration of the Campaign Against the Central Propaganda Department*:

Based upon the Central Propaganda Department’s ‘Stability above all,’ we ask whose stability overrides all else? Whenever the Central Propaganda Department puts a stop order on a news story, we see that it is the stability of the

*corrupt elements which overrides all else. It is the stability of the people who oppress little people which overrides all else. It is stability of the people who pay off the Central Propaganda Department which overrides all else. It is the stability of the sub-contractor boss who does not pay his workers which overrides all else. It is the stability of the people who forced the poor downtrodden people to travel thousands of miles to file petitions which overrides all else.*³⁸

Panelists testified to the Commission that those feared most by China's elites are neither student idealists nor groups that advocate democracy, but rather the disenfranchised Chinese citizens who are tired of facing economic and political marginalization while the corrupt prosper.³⁹ Beijing focuses considerable attention and resources on managing the perceptions of these disenfranchised groups. Referring to the targeting of these controls, Dr. McCormick claims that "the people [who] get the worst shake in contemporary China are poor people, and those are mainly rural people and people [who] live in Western China."⁴⁰ Ironically, workers, farmers, and China's large rural population—groups that once ushered the Communist Party into power—are now those China perceives it most needs to control.

U.S. Government Efforts to Overcome Controls

For decades the U.S. government has financially supported institutions to fight the kinds of information controls that countries like China employ. The Broadcasting Board of Governors (BBG), a federal agency, is one of the best known and most active of these institutions. Its goal is to broadcast accurate and objective news and information about the United States and the world to audiences overseas. BBG supervises the International Broadcasting Bureau (IBB) and its international broadcasting organizations including Voice of America (VOA), and provides support and services to separate broadcasting organizations including Radio Free Asia (RFA). VOA's Mandarin Language Service and RFA use short-wave radio signals, television signals, and the Internet to reach audiences in China. They transmit in Mandarin, Cantonese, Tibetan, and Uighur. Both organizations have reporters within China, although their number is limited by the Chinese government. Both services have won several international awards for the quality of their broadcasts.

Despite international laws that forbid intentionally interrupting radio frequencies registered with the United Nations' International Telecommunications Union (ITU), including those used by RFA and VOA, the Chinese government regularly jams American broadcasts into China.⁴¹ Chinese censors also obstruct access to these services' Chinese language websites and block their e-mails to millions of recipients throughout China.⁴² Beijing considers the information these organizations provide to the Chinese people a threat to the control regime it has so carefully constructed. In response, it has purchased expensive equipment from abroad to block foreign broadcasts. RFA's Mr. Southerland testified that:

[A]ccording to industry sources, a 2004 Chinese government purchase of 16 more high-powered transmitters from Thales⁴³ ... signaled China's plans to intensify its efforts. These new transmitters cost more than \$1.5 million each, but this was just a small part of the overall cost needed to operate, maintain, and manage such a large jamming network. A single transmitter used by RFA may attract a dozen small local jammers and one or two larger jammers working against it. The jamming often consists of Chinese funeral music, which incorporates the harsh sounds of Chinese horns, drums, and gongs—and sends Chinese listeners scrambling to change the frequency.⁴⁴

BBG has confronted the Chinese government about this issue on more than one occasion, as have the U.S. Ambassador to China and other U.S. government officials.⁴⁵ According to RFA's Mr. Southerland, when Beijing is questioned about its illegal jamming practices the response typically is either denial or professed incompetence. "The Chinese simply answer ... we've got a lot of channels now. Maybe there's some overlap. We don't really jam."⁴⁶ Mr. Ken Berman, Director of Information Technology for the IBB, testified before the Commission that the IBB "regularly file[s] protests through the FCC and [the] Department of Commerce to the ITU, but [China's response is,] 'It was just an accident, didn't mean to do that, it's a big country, who can control this stuff?' It doesn't resonate [with them]. They don't seem to take it seriously."⁴⁷

Because of these unique challenges, BBG and its broadcasting organizations have worked hard to circumvent Chinese censorship and reach their Chinese listeners using alternative methods. Both VOA and RFA shift their frequencies regularly to avoid Chinese jamming and regularly build mirrors of their official websites to avoid being blocked by China's "Great Firewall." Mr. Berman explains: "We send out millions of e-mails every day for the Voice of America Mandarin Service and Radio Free Asia Mandarin Service. Within those e-mails are texts that are produced by the journalists from the two organizations, VOA and RFA. More important, though, we put [in] a proxy link."⁴⁸ ⁴⁹ VOA's and RFA's ultimate goal is not just to bring listeners from China to their websites, but also to provide a "web-portal" as an alternate route to Internet sites to which the Chinese government has blocked access.⁵⁰ To enable people in China to hear their broadcasts and access their web pages, RFA and VOA constantly must change their broadcast frequencies and web addresses.

During the Commission's hearing on July 31, witnesses noted that despite China's censorship of U.S. broadcasts and Internet material, the United States allows Chinese state-controlled media franchises to distribute and broadcast their programming freely in the United States. China Central Television (CCTV), state-controlled news giant *Xinhua News Agency*, radio giant China Radio International (CRI), and many other Chinese government media are not denied access to the U.S. market. Mr. Baum argues that the United States "must insist on reciprocity just like we would in any trade issue."⁵¹

U.S. Corporate Involvement

The involvement of U.S. information technology firms in China's censorship activities has been and continues to be contentious. Dr. Esarey told the Commission that the most advanced and sophisticated censorship technologies used in China are developed in Silicon Valley and that most of China's purchases of such technologies are from the United States.⁵² Internet search providers Google, Yahoo, and Microsoft have cooperated with Chinese authorities on censorship, and Yahoo has handed over personal information on its users to Chinese security services.⁵³ Hardware manufacturers also have faced criticism. Cisco Systems has been accused of selling sophisticated equipment to the Chinese government that has enhanced the PRC's ability to censor information online. Dr. James Mulvenon, Deputy Director at the Defense Group Inc., testified to the Commission in 2005 that while Cisco has sold the Chinese government routing equipment, the firm does not custom engineer its products to meet the specific needs of Chinese censors.

U.S. Corporate Responses to Contentious Chinese Business Practices

Yahoo: Responding to allegations that Yahoo filters the content of its search results in China, Yahoo's Senior Vice President and General Counsel Michael Callahan testified before Congress in 2006 that "where [China's] government requests that we restrict search results, we will do so if required by applicable laws and only in a way that impacts the results as narrowly as possible. If we are required to restrict search results, we will strive to achieve maximum transparency to the user."⁵⁴ When questioned about Yahoo releasing information on its Chinese users to Chinese authorities, who then use it to prosecute Chinese dissidents, Mr. Callahan acknowledged that Yahoo and its Chinese partner Alibaba.com are not able to protect the privacy and confidentiality of their Chinese users from the PRC government.

Microsoft: Microsoft has been accused of filtering both the content of its search results to Chinese users, and the content of blogs that the company hosts in China. Mr. Jack Krumholtz, Managing Director of Federal Government Affairs and Associate General Counsel for Microsoft, testified before Congress in 2006 that "Microsoft is deeply troubled by the restrictive regulations we operate under in China. We comply with them only to the extent required by law. However, to suggest that we can resist or defy these regulations assumes a much different reality than the one we deal with in China on a regular basis."⁵⁵

Google: During a 2006 Congressional hearing, Google's Vice President for Corporate Communications and Public Affairs Elliot Schrage testified that Google censors its search results in China. "We are not happy about it, but that is the requirement ... we provide disclosure [to Chinese users] when we are filtering ... politically sensitive search requests."⁵⁶ He also testified that Google does not provide the email and blogging services that

**U.S. Corporate Responses to
Contentious Chinese Business Practices—Continued**

Yahoo and Microsoft do because Google is unwilling to comply with the PRC laws governing their management.⁵⁷

Cisco: In response to accusations that Cisco Systems is facilitating China's Internet censorship by providing sophisticated firewall equipment to the agencies that filter online content, Cisco's Director of Asian Public Relations, Terry Alberstein, stated that "Cisco Systems does not participate in the censorship of information by governments," that "it is our users, not Cisco, that determine the applications that they deploy," and that "networking products from Cisco and our competitors are not covered by" laws that prohibit selling them to foreign governments.⁵⁸

Recent developments have put pressure on American firms that aid censorship in China. The Office of the Comptroller of New York City, which held 486,617 shares of Google's Class A stock, led a minority of Google shareholders to force a vote to end Google's censorship practices in China.⁵⁹ At the urging of the company's co-founders Messrs. Larry Page and Sergey Brin, the proposal was defeated.

Yahoo also has faced new challenges. Earlier this year the wife of Chinese political prisoner Mr. Wang Xiaoning, who currently is serving a ten-year prison sentence in China for distributing articles advocating democracy using his Yahoo email account, filed a civil suit against Yahoo in the U.S. district court for the Northern District of California under the Alien Tort Claims Act and the Torture Victims Protection Act. The suit alleges that Yahoo played a role in the arrest and torture of her husband by releasing his personal information to the Chinese government.⁶⁰ Mr. Wang's prosecutors reportedly thanked Yahoo for its cooperation during his trial.⁶¹ As of the date of this Report's publication, no verdict has been reached in the civil suit.

In January 2007, F&C Asset Management, an investment firm based in the United Kingdom, "gave a public 'warning' to technology, media and telecoms companies to rethink 'tough issues' such as setting up shop in China while toeing Beijing's line on censorship."⁶² In an F&C report entitled *Managing Access, Security & Privacy in the Global Digital Economy*, the company warned that "as a long-term investor in [technology, media, and telecommunications] companies, [we] will look for evidence they are taking the necessary steps to avoid the pitfalls of regulatory clampdowns, penalties, and public relations disasters."⁶³ Other financial firms have made similar statements.⁶⁴

Such scrutiny and criticism appear to be encouraging computer technology firms to reassess their activities that may be used to support China's censorship. In January 2007, a consortium of U.S. technology firms and human rights organizations was formed to discuss the establishment of an international code of ethics on issues related to privacy and censorship—with the intention of completing a code by the end of 2007. At the time this report was published, no evidence of progress in this effort has been made available by the participants.

China's Worldwide Perception Management

Beijing is engaged in a worldwide perception management campaign, according to Dr. Derek Reveron, a professor at the U.S. Naval War College.⁶⁵ While all nations have to be concerned about international opinion and engage to one extent or another in efforts to influence opinions, China's perception management campaign is unique in that the Chinese Communist Party maintains tight political and media controls to influence opinion domestically and is seeking to use similar tactics to influence foreign populations.

China's state news service, *Xinhua*, is the primary Chinese domestic news service. It also is available in Chinese and English to anyone with Internet access, and is carried alongside AP and Reuters as an international news feed in some locations.⁶⁶ *Xinhua* purports to supply fact-based journalism. Yet, as Ms. He Qinglian noted in her testimony before the Commission, the *Xinhua News Agency* is, in fact, a propaganda outlet for the CCP:

*News reports from the official Xinhua News Agency carefully select materials favoring China but ignore all the news the government dislikes. For example, in recent years, the Chinese media repeatedly reported the success of the development of friendship and trust with Russia and African countries, but when Russia implements policies against Chinese immigrants or people of St. Petersburg opposed a plan to build a new Chinatown in the city, such news is purposely excluded. The same situation can be found in China's news reporting about the Sino-African relationship. ... [T]he news about how African people perceive China as a neocolonialist today and how China's government buys votes from African governments in U.N. organizations to defend its human rights record doesn't exist at all.*⁶⁷

Chinese leaders are seeking an international reputation that is benign if not benevolent, and are using every available state resource to convey their message.⁶⁸ Party news outlets such as *Xinhua* are used in a carefully planned and executed perception management campaign that is directed not only at domestic audiences but also at foreign populations. While the ability of China's leaders to control information in the media enables their perception management efforts to be effective, it also makes those efforts fundamentally different than the conventional diplomatic strategies of other countries whose media are not constrained or controlled in this manner.

China has worked diligently over the last two decades, as Dr. Reveron stated, "to promote a non-aggressive image of itself through a policy of non-interference, outreach to foreign publics and governments through public works projects, participation in the international system, and comparisons to the United States which it characterizes as a hegemon on the offensive."⁶⁹ This is in keeping with a foreign policy statement made by Party Chairman Deng Xiaoping in 1991 when he enunciated that China should, "Observe calmly; secure our position; cope with affairs calmly; hide our capacities and bide our time; be good at maintaining a low profile; never claim leadership."⁷⁰

Case Study: 2001 EP-3 Incident

Dr. Reveron testified to the Commission that, in times of crisis, China has sought to manipulate information flows in order to portray itself in a positive light or as the victim of U.S. aggression. He illustrated his point by recounting China's response to the incident when a Chinese fighter collided with a much slower and less maneuverable U.S. EP-3 reconnaissance aircraft flying in international airspace in April 2001. The damaged EP-3 was forced to make an emergency landing at the nearest location, China's Hainan Island. By holding the crew in isolation for the first three days and monopolizing the flow of information, PRC officials were able to charge that the U.S. had violated China's airspace and therefore its sovereignty. China portrayed the United States as the aggressor in the crisis.⁷¹

Initially, U.S. press reports were critical of the Chinese pilot who caused the collision and sympathetic to the crew of the EP-3 that was forced to make an emergency landing. *Xinhua* did not cover the story for the first two days after the incident, causing an information blackout while the Chinese leadership was formulating its strategy.⁷² However, once *Xinhua* began to print articles that referred to the EP-3 as a "spy plane," criticized the U.S. as a hegemon, and focused attention on the alleged violation of Chinese sovereignty, some American media outlets used some of *Xinhua*'s rhetoric in their stories about the incident.⁷³ Some U.S. news outlets began referring to the downed American aircraft, which was clearly marked "U.S. Navy," as a spy plane, although it was flying in international airspace along a frequently-flown route following a publicly-available flight plan and performing overt reconnaissance missions to which Chinese officials previously had not objected.⁷⁴

Even the *New York Times* printed articles describing the aircraft in the way *Xinhua* had mischaracterized it.⁷⁵ The accounts published or aired by many U.S. and other Western media adopted China's angle: a story about U.S. hegemony and spying, rather than a story about an aggressive Chinese fighter pilot who caused a collision in international airspace that risked the lives of 24 American personnel, and about China's holding those men and women captive for 10 days.⁷⁶

Perception management in this case appears to have been effective for China. Months after the incident, in November 2001, in an article about unmanned aerial vehicles targeting Osama Bin Laden's camps in Afghanistan, *The Wall Street Journal* noted, "The White House and the State Department, still raw after the downing of the U.S. spy plane over China, feared international repercussions if one of the armed drones crashed or was otherwise discovered."⁷⁷

Case Study: 2001 EP-3 Incident—Continued

China's successful manipulation and control of information in this case created a lasting misperception of the EP-3 incident that was sufficiently strong to affect future U.S. policy. Dr. Reveron described the case as noteworthy:

The New York Times and other media outlets were simply unwitting participants in the process because Xinhua was the only press agency that had any information. ... [I]n the 2001 case, there was no alternative coverage. It was perfect again from China's perspective because it was a very isolated part of China. There were no Western media reporters there. Even U.S. access was very restricted for the first three days. And so China, I think, very effectively controlled what the facts were and they shifted from what was clearly an accident likely caused by aggressive behavior by a fighter pilot, relative to the EP-3. But, they very quickly changed what was an accident into a violation of Chinese sovereignty. They raised all the other issues in terms of why is the United States even conducting reconnaissance flights in international airspace, and they very effectively controlled the story. I would say in the global media age, an outlet like Xinhua is readily readable and read simply because people rely on things like Google news service and so on, and it's [treated] almost like a wire service in that sense.⁷⁸

According to a recent report by Dr. Anne-Marie Brady at the University of Canterbury in New Zealand, the CCP has divided its propaganda work into two categories: internal (for which the CPD holds primary responsibility) and external (for which the Office of Foreign Propaganda [OFP] holds principal responsibility). Dr. Brady found that both these "highly secret" organizations are very closely linked and coordinated.⁷⁹ The OFP is supervised by the Foreign Propaganda Leading Small Group, consisting of a handful of senior CCP leaders led by Mr. Cai Wu, who also heads the State Council Information Office.⁸⁰

In her report, Dr. Brady lists China's guidelines for propaganda. They include (1) issue no bad news during holidays or on other sensitive dates, (2) demonize the United States, (3) do not promote the views of the enemy, and (4) use international news to mold public opinion on issues relating to China. She goes on to explain the guideline pertaining to use of international media:

Selective reporting on international news has proven to be a very effective means of molding public opinion on issues relating to China. Hence, throughout the 1990s, the Chinese media gave detailed coverage of the problems of post-communist societies, while ignoring success stories. Such stories helped to mold public opinion on the likely outcome if China [were] to become a multi-party state. Similarly, China reported factually, but without comment, on the difficulties North Korea faced throughout the 1990s and early 2000s. This served as a caution to those on the left who were critical of China's market-oriented reforms.

During the lead-up to the Iraq War the Chinese media [were] instructed by the Central Propaganda Department to bring the thinking of the Chinese people in line with that of the party centre, which held the view of opposition to the U.S. invasion. Coverage of the war was used as a means to attack the U.S. government's position on human rights and other sensitive topics. Reporting on the war was strictly controlled; only officially designated Chinese journalists were permitted to travel to Iraq to report the war.⁸¹

The way in which China reported—or failed to report—information about the development of Sudden Acute Respiratory Syndrome (SARS) and what steps the PRC government was taking in response provides an excellent example of the application of the propaganda rules. SARS first appeared in November 2002, just prior to the Chinese New Year, but there was no media coverage until April 2003, after the holiday season had ended.⁸² When coverage was permitted, it was carefully crafted. Dr. Brady explains how the coverage attempted to manipulate both domestic and foreign media coverage:

When the signal was finally given in April 2003 that SARS could be discussed in the Chinese media, the propaganda system went into full swing, advising the population on how to avoid the disease and the means which the government was employing to bring the situation under control. Editors were instructed to “guide public opinion” (meaning focus on positive stories) on the topic. They were told to pay attention to SARS-related stories of interest to international public opinion as well as the concerns of people in China. Great effort was put into targeted foreign propaganda on the topic of SARS, to eradicate the impact of negative reporting on this topic by the foreign media.⁸³

Information About the Safety of Food and Other Products Produced in China

A recurrent theme in international headlines during 2007 has been the problem of unsafe food and consumer goods manufactured in China and either consumed there or exported to other countries including the United States. Contaminated pet food, toothpaste with toxic ingredients, toys painted with lead-based paint, exploding cell phone batteries, and seafood covered in paraffin wax and colored with industrial dyes have been among the unsafe goods that have made their way from China to the United States in the past year. In a recent Congressional hearing on Chinese food imports, Mr. David Nelson, Senior Investigator for the House Committee on Energy and Commerce, said that “the Chinese government appears determined to avoid embarrassing food safety outbreaks in export markets due to the damaging and potentially lasting effect this would have on the ‘Made in China’ branding.”⁸⁴

China finds it a daunting task to adequately oversee and regulate between 450,000 to one million food producers (most of them rural firms with fewer than ten employees). This difficulty is compounded because a constellation of ten different government agen-

cies divides authority and responsibility for food safety. Media controls and information restrictions, however, also have played a significant role in China's food and product safety problems. In a democracy, the media act as an independent watchdog. Where the media are able to play this role, if a product has a design flaw, or a manufacturer is using an inferior ingredient, a whistleblower can report the problem to the media, and there is a significant possibility the matter will be aired and public opinion will force the manufacturer to address the problem. Dr. Oded Shenkar, a business professor at Ohio State University, believes that because the media in China are not independent from the government, this mechanism generally is unavailable there. "There is a direct [relationship] between the tight control of information in China and the ability to identify, monitor, and correct the defective product phenomenon."⁸⁵

There frequently are additional factors at work in China that reduce the likelihood such problems will be exposed by the media. Dr. Shenkar writes that:

- (1) *"in an authoritarian environment where information is tightly controlled, people are less likely to complain since they have little hope their complaint will be acted upon,"*⁸⁶
- (2) *"where access to information is closely guarded, it is difficult for even government officials to collect and analyze relevant information and thus become aware of a problem,"*⁸⁷
- (3) *"given a culture of information filtering and unaccountability, producers are unlikely to collect data from consumers that would point to a problem,"*⁸⁸ and
- (4) *"given information control and the nature of government in China, different sections of the government filter information and block its passage from [one to the] other in an effort to look good and preempt damaging information from reaching other government agencies and rival political factions. This is especially true for local governments [that] also have a stake in protecting infringing enterprises under their jurisdiction so as to protect employment, and as a colluding step to assist enterprises [in which] the local government might be invested."*⁸⁹

Even when financial interests are not a factor, political interests may be. Beijing on numerous occasions has suppressed news that the CCP or the government's leadership believes might harm China's international image. When the government is forced to acknowledge a problem, in many cases its various components have made conflicting announcements. For example, in late July 2007, in response to questions and challenges by international media on the surge in unsafe Chinese exports, "Beijing officials [insisted] that 99 percent of the goods China exports meet quality standards and that the foreign media [are] exaggerating the extent of the problem."⁹⁰ But previously, on July 4, the Chinese government had said that "nearly a fifth of the food and consumer products that it checked in a nationwide survey this year were found to be substandard or tainted, underscoring the risk faced by its own consumers even as the country's exports were coming under greater scrutiny overseas."⁹¹ To some extent this is a function of a break-

down in the government's effort to "spin" an unfavorable and potentially destructive issue—something with which the United States is not unfamiliar. But there also have been restrictions imposed on media pursuit of facts and information in these cases—by both domestic and international media—and on what information they have been able to obtain that China's media may publicize. Some U.S.-based journalists have been refused permission to travel to or within China to gather information for stories on food and product safety issues.

Less obvious forms of information controls have compounded these problems. Because of the opacity of China's food and product regulation process and the unwillingness of the regulatory agencies to communicate or cooperate meaningfully with their U.S. counterparts, the U.S. government has little choice but to warn its population that all Chinese imports may be suspect. Dr. Scott Gottlieb, a Resident Fellow at the American Enterprise Institute and a former senior official at the U.S. Food and Drug Administration (FDA), testified before the Commission that because "we don't know who the violators in China are ... it's very difficult for us to take a risk-based approach in inspecting imports."⁹² No government has the ability to inspect every food and product shipment arriving at its ports for safety and regulatory compliance; it instead needs to cooperate with transparent foreign agencies to ensure uniformity in domestic production standards. Mr. Drew Thompson, Director of China Studies and Starr Senior Fellow at The Nixon Center, agrees: "This is particularly vital in sectors where inadequate transparency threatens U.S. national interests—such as public health, the environment, and food safety."⁹³

These problems with regulatory cooperation have taken on other forms as well. Following the import of Chinese pet food that contained lethal levels of contaminants, the U.S. government asked Beijing for permission to carry out an inspection of the suspect Chinese manufacturing facilities. Dr. Gottlieb testified that "I don't know what's publicly known with respect to the difficulty the FDA had on [this] case. It is, I think, a matter of public record that the FDA did have problems getting in immediately after that, getting access to some of the manufacturing facilities, and it took some high level help to get our inspectors over there."⁹⁴ And even when the inspectors eventually obtained visas to enter China, they had "difficulty getting access to both the facilities and the information needed to conduct their own inspections."⁹⁵ In fact, by the time FDA personnel were able to travel to at least one of these facilities, it already had been destroyed by bulldozers.

The information controls and regulatory opacity prevalent in China make it difficult or impossible for both government health and safety officials and consumers, whether in China or elsewhere, to understand the scope, particular features, and gravity of a problem that originates in China. This, in turn, compounds the challenge authorities face as they try to limit the exposure of their citizens to the problem. When the pervasiveness or frequency of a particular problem suggests a systemic failure that may require a large-scale response by other nations, the impediments to their obtaining timely and accurate information posed by China's informa-

tion controls make a challenging task significantly more challenging.

Information on Public Health and Infectious Disease Outbreaks

Attempts by the Chinese government to control information it deems embarrassing have had profound effects on international attempts to control infectious diseases. In an effort to maintain public confidence in Beijing's leadership, China's central government has continued to suppress reports on the outbreak of diseases and other public health emergencies. Indeed, the Chinese National People's Congress is reviewing a proposed "Law on Responding to Sudden Incidents" to codify long-standing policies prohibiting foreign and domestic media from reporting on specified issues, including the outbreak of disease.⁹⁶

Beijing is continuing to pursue its policy of silence despite the consequences of previous attempts to suppress public notice during the outbreak of SARS in 2003 and Avian Flu (H5N1) in 2004. Most recently, the government has been reluctant to acknowledge the outbreak of an unidentified swine virus that has been sweeping through China's pig population. The Chinese government officially claims that only 68,000 pigs have died from the virus, but this statistic is widely greeted with great skepticism. The Chinese government has banned local journalists from visiting affected areas, insisting instead "that newspapers use dispatches from the state news agency."⁹⁷ Reports also have accused the Chinese government of refusing to share tissue samples of infected pigs with the international community.⁹⁸ Of great concern around the world is that the disease's propensity—and method—for spreading, and, in particular, for afflicting humans, also are unknown.

The Commission has addressed issues of this kind in the past. In a 2003 hearing on the outbreak of SARS, Commission witnesses described Beijing's use of information controls to suppress public notice of the serious disease. Between November 2002, when the epidemic began, and April 2003, when China's President Hu acknowledged the problem and pledged to address it more transparently, Chinese media were forbidden to report on anything but official pronouncements on the outbreak. Chinese Internet filters were created to suppress online content related to SARS.⁹⁹ Beijing's initial unwillingness to openly discuss the disease, and its refusal to meaningfully cooperate with international health organizations, produced an international outcry, especially when the disease began spreading outside China. Eventually Beijing realized the need to confront the epidemic directly and publicly and apologized for mishandling the incident; officials also promised not to repeat the mistakes and to deal with any future disease outbreaks transparently and in keeping with international norms. Subsequent actions by the Chinese leadership raise considerable doubts about this pledge.

The first test of Beijing's promise came almost immediately after the central government began acknowledging what occurred during the SARS epidemic. Avian Flu (H5N1) outbreaks in East Asian countries had been regularly reported in the region prior to and

during the SARS outbreak (although they had not been reported by Chinese authorities). China's Ministry of Agriculture reported no outbreaks of H5N1 until April 2004, and then only when other nations in the region began reporting a surge in the disease. The PRC again refused to cooperate usefully with international health authorities. Ms. Erika Elvander, an International Health Officer with the U.S. Department of Health and Human Services, recounted such an incident recently: "When wild birds began dying in Qinghai in April 2005, the [Chinese] Ministry of Agriculture delayed allowing international scientists and observers into the actual areas where the deaths had occurred."¹⁰⁰ Similar incidents had occurred during the SARS epidemic. In its 2005 report to Congress, the Congressional-Executive Commission on China found that "Chinese government control over the flow of information has hampered international efforts to combat the spread of the H5N1 avian flu virus."¹⁰¹

Conclusions

- Over the decades China has built one of the world's most effective information control systems. The Chinese government controls the content of newspapers, magazines, television, radio, and the Internet. Chinese journalists have been demoted, fired, imprisoned and beaten for violating restrictions on media content. Internet users face similar restrictions and violators may be imprisoned.
- China censors information and communications pertaining to some broad issues like democracy, human rights, and the Falun Gong as well as to more subtle issues related to domestic current affairs and political developments. Strict penalties for addressing forbidden topics, and the uncertainties of where the fine lines fall at any moment, have created an environment of strict self-censorship among Chinese journalists. These self-imposed restrictions effectively stifle information Beijing deems undesirable.
- China's information controls are designed to perpetuate the existence of the Chinese political structure and the Chinese Communist Party's control of the nation, and also to maintain a stable environment for China's new "rising power class," the primary beneficiaries of the developing two-tiered society who are seeking to maintain their favored status.
- Through its media control regime, the Chinese government has been able to manipulate and influence the perspectives of many Chinese citizens. While the majority of the Chinese people understand that the information provided by Chinese state-owned media organizations may not be free of censorship and propaganda, they have little choice but to rely on it when forming their opinions about the outside world. Beijing has used this capacity to create deep feelings of nationalism inside China and can use it to incite strong anti-foreigner sentiments among the Chinese people when it wishes to do so.
- The strong nationalism Beijing has fostered may constrain its options to respond to international incidents. This could result in

exacerbating tensions in a sensitive situation and turning a misunderstanding into a conflict. The media organizations supervised by the U.S. Broadcasting Board of Governors struggle in the face of Chinese censorship to provide accurate news and information to the people of China through radio and television broadcasts and the Internet. In violation of international laws the Chinese government successfully jams or blocks access to many of these broadcasts and Internet messages and content.

- Some U.S. technology firms have cooperated with and contributed to the Chinese government's censorship and propaganda systems by supplying hardware and software. In some but not all these cases, their cooperation may be a Chinese legal requirement.
- Chinese leaders are seeking an international reputation that is benign if not benevolent, and are using every available state resource in their effort. Chinese Communist Party news outlets such as *Xinhua* are employed in a concerted perception management campaign that is directed not only at domestic audiences but also at foreign populations.
- China's control and manipulation of information make it difficult or impossible for officials responsible for food and product safety in the United States and other nations to identify potential safety problems in Chinese imports on a timely basis and intervene to protect the health and safety of consumers.

RECOMMENDATIONS

- The Commission recommends that Congress increase funding for the Broadcasting Board of Governors' radio, television, and Internet news broadcasts to the people of China, to enable those broadcasts to be expanded and to reach a greater proportion of China's population despite jamming and other censoring methods employed by the government of the People's Republic of China.
- The Commission recommends that Congress urge high-level Administration officials, including Secretary of the Treasury Henry Paulson, to discuss the issue of China's jamming of Voice of America and Radio Free Asia broadcasts during U.S.-China bilateral forums, including the Strategic Economic Dialogue (SED).
- The Commission recommends that Congress prohibit U.S. companies from disclosing to the central or any subordinate government in the People's Republic of China, in the absence of formal legal action by that government, information about Chinese users or authors of online content. Congress should require that a U.S. company compelled to take such actions by a government in the PRC inform the U.S. government of its actions and the government's basis for compelling it to take those actions. A compilation of this information should be made publicly available semi-annually.
- The Commission recommends that Congress urge the Administration to engage the government of the People's Republic of China in a high level dialogue with the objective of obtaining its agreement to increase international access to accurate, timely, and complete information on issues potentially affecting public health outside China.

ENDNOTES FOR CHAPTER 5

1. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of He Qinglian, July 31, 2007.
2. "New China media curbs condemned," *BBC News*, September 12, 2006.
3. Carin Zissis, "Media Censorship in China," *The Council on Foreign Relations*, September 25, 2006.
4. Human Rights Watch, *Media Freedom: Section V—Harassment, Intimidation and Censorship of Chinese Journalists*, August 3, 2007. china.hrw.org/issues/media_freedom.
5. Anne Applebaum, "Let a Thousand Filters Bloom," *the Washington Post*, July 20, 2005.
6. Bob Dietz, "Empty Promises of Press Freedom," *South China Morning Post*, December 12, 2006.
7. Carin Zissis, *Backgrounder: Media Censorship in China*, Council on Foreign Relations. www.cfr.org/publications/11515.
8. Kristen Jones, *China's Hidden Unrest*, Committee to Protect Journalists, May 2006. www.cpj.org/Briefings/2006/DA_spring_06/china/china_06.html.
9. He Qinglian, Senior Research Scholar, Human Rights in China, telephone interview with Commission staff, July 19, 2007.
10. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of He Qinglian, July 31, 2007.
11. Dr. Andrew Nathan, Professor, Columbia University, e-mail interview with Commission staff, July 25, 2007.
12. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of William Baum, July 31, 2007.
13. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of William Baum, July 31, 2007.
14. Maureen Fan, "China's Party Leadership Declares New Priority: 'Harmonious Society,'" *The Washington Post*, October 12, 2006.
15. Reporters Without Borders, *China—Annual Report 2007*, (New York, NY: 2007). www.rsf.org/print.php3?is_article=20779.
16. In China's "Regulations of Reporting Activities in China by Foreign Journalists during the Beijing Olympic Games and the Preparatory Period" the easing of restrictions is set to expire on October 17, 2008.
17. Carin Zissis, *Olympic Pressure on China*, Council on Foreign Relations, May 4, 2007.
18. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Xiao Qiang, July 31, 2007.
19. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Barrett McCormick, July 31, 2007.
20. Anne-Marie Brady, "Guiding Hand: The Role of the CCP Central Propaganda Department in the Current Era," *Westminster Papers in Communication and Culture*, Issue 3.1, Spring 2006.
21. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Ashley Esarey, July 31, 2007.
22. Reporters Without Borders, *China—Annual Report 2007*, (New York, NY: 2007). www.rsf.org/print.php3?is_article=20779.
23. He Qinglian, *Media Control in China*, Human Rights in China (New York, NY: 2004), p. 3.
24. Ashley Esarey, *Speak No Evil: Mass Media Control in Contemporary China*, (Freedom House, Washington, DC: February 2006), p. 5.
25. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Ashley Esarey, July 31, 2007.
26. Ashley Esarey, *Speak No Evil: Mass Media Control in Contemporary China*, (Freedom House, Washington, DC: February 2006), p. 2.
27. Carin Zissis, *Backgrounder: Media Censorship in China*, Council on Foreign Relations. www.cfr.org/publications/11515.
28. Ashley Esarey, *Speak No Evil: Mass Media Control in Contemporary China*, (Freedom House, Washington, DC: February 2006), p. 4.

29. Open Net Initiative, *China Country Report*. www.opennet.net/research/profiles/china.
30. Open Net Initiative, *China Country Report*. www.opennet.net/research/profiles/china.
31. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Xiao Qiang, July 31, 2007.
32. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Xiao Qiang, July 31, 2007.
33. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Ashley Esarey, July 31, 2007.
34. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of William Baum, July 31, 2007.
35. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Barrett McCormick, July 31, 2007.
36. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Barrett McCormick, July 31, 2007.
37. Jiao Guobiao was subsequently fired from the Beijing University.
38. "Declaration of the Campaign against The Central Propaganda Department," Jiao Guobiao, April, 2004, translated by EastSouthNorthWest Center.
39. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of He Qinglian, July 31, 2007.
40. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Barrett McCormick, July 31, 2007.
41. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Dan Southerland, July 31, 2007.
42. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of William Baum, July 31, 2007.
43. Thales is a French electronics company that produces high technology products for the aerospace and defense markets.
44. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Dan Southerland, July 31, 2007.
45. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of William Baum, July 31, 2007.
46. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Dan Southerland, July 31, 2007.
47. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Ken Berman, July 31, 2007.
48. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Ken Berman, July 31, 2007.
49. A proxy link allows Internet users to circumvent filters they face on their local networks by directing their traffic through a seemingly benign intermediary. Chinese Internet users often use 'proxies' to gain access to websites and online information that would otherwise be blocked by the Chinese government.
50. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Ken Berman, July 31, 2007.
51. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of William Baum, July 31, 2007.
52. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Ashley Esarey, July 31, 2007.

53. Amnesty International, *Censorship in China*. www.amnestyusa.org/Internet_Censorship/Implicated_companies/page.do?id=1101584&n1=3&n2=26&n3=1035.
54. U.S. House of Representatives Subcommittees on Africa, Global Human Rights and International Operations, and Asia and the Pacific, *Hearing on the Internet in China: A Tool for Freedom or Suppression?*, testimony of Michael Callahan, February 15, 2006.
55. U.S. House of Representatives Subcommittees on Africa, Global Human Rights and International Operations, and Asia and the Pacific, *Hearing on the Internet in China: A Tool for Freedom or Suppression?*, testimony of Jack Krumholtz, February 15, 2006.
56. U.S. House of Representatives Subcommittees on Africa, Global Human Rights and International Operations, and Asia and the Pacific, *Hearing on the Internet in China: A Tool for Freedom or Suppression?*, testimony of Elliot Schrage, February 15, 2006.
57. U.S. House of Representatives Subcommittees on Africa, Global Human Rights and International Operations, and Asia and the Pacific, *Hearing on the Internet in China: A Tool for Freedom or Suppression?*, testimony of Elliot Schrage, February 15, 2006.
58. John Earnhardt, "Cisco/China 'Ruckus'," *Cisco High Tech Policy Blog*, August 25, 2005.
59. Erik Larkin, "Google Shareholders Vote Against Anti-Censorship Proposal," *PC World*, May 10, 2007.
60. Rhys Blakely, "Yahoo! Sued over torture of Chinese dissident," *Time Online*, April 19, 2007.
61. Ariana Eunjung and Sam Diaz, "Advocates Sue Yahoo In Chinese Torture Case," *The Washington Post*, April 19, 2007.
62. Rhys Blakely, "Yahoo! Sued over torture of Chinese dissident," *Time Online*, April 19, 2007.
63. F&C Assets Management PLC, *Press Release: New Report highlights core business risks facing Technology, Media and Telecoms companies*, January 17, 2007, <http://www.fandc.com/new/press/>.
64. Indrajit Basu, "Internet Giants to Tackle China's Censorship," *The Asia Times*, February 13, 2007. www.atimes.com/atimes/China_Business/1B13Cb01.html.
65. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Derek Reveron, March 29, 2007.
66. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Derek Reveron, March 29, 2007.
67. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of He Qinglian, July 31, 2007.
68. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Derek Reveron, March 29, 2007.
69. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Derek Reveron, March 29, 2007.
70. U.S. Department of Defense, *Annual Report to Congress on the Military Power of the People's Republic of China*, (Washington, DC: July 2007), p. 6.
71. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Derek Reveron, March 29, 2007.
72. Peter Callamari and Derek Reveron, "China's Use of Perception Management," *International Journal of Intelligence and Counterintelligence*, 16: 1-15, 2003, 6-7.
73. Peter Callamari and Derek Reveron, "China's Use of Perception Management," *International Journal of Intelligence and Counterintelligence*, 16: 1-15, 2003, 7-10.
74. Peter Callamari and Derek Reveron, "China's Use of Perception Management," *International Journal of Intelligence and Counterintelligence*, 16: 1-15, 2003, 10; U.S. Department of Defense, *Secretary Rumsfeld Briefs on EP-3 Collision*, News Transcript, April 13, 2001.
75. Peter Callamari and Derek Reveron, "China's Use of Perception Management," *International Journal of Intelligence and Counterintelligence*, 16: 1-15, 2003, 9; See also U.S. Joint Chiefs of Staff, Joint Publication 1-02, which defines clandestine operations as, "an operation sponsored or conducted by governmental departments or agencies in such a way as to assure secrecy or concealment." The cir-

cumstances of the EP-3 mission in this case make it clear that it was not acting as a spy plane.

76. U.S. Department of Defense, *Secretary Rumsfeld Briefs on EP-3 Collision*, News Transcript, April 13, 2001.

77. Neil King, Jr. and David S. Cloud, "CIA Drones Spotted Bin Laden Camps But Couldn't Shoot," *The Wall Street Journal*, 23 November, 2001, A1.

78. U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Impact on the United States and the Asia-Pacific*, testimony of Derek Reveron, March 29, 2007.

79. Anne-Marie Brady, "Guiding Hand: The Role of the CCP Central Propaganda Department in the Current Era," *Westminster Papers in Communications and Culture*, (University of Westminster, London: 2006), p. 60.

80. Anne-Marie Brady, "Guiding Hand: The Role of the CCP Central Propaganda Department in the Current Era," *Westminster Papers in Communications and Culture*, (University of Westminster, London: 2006), p. 60.

81. Anne-Marie Brady, "Guiding Hand: The Role of the CCP Central Propaganda Department in the Current Era," *Westminster Papers in Communications and Culture*, (University of Westminster, London: 2006), p. 72.

82. Anne-Marie Brady, "Guiding Hand: The Role of the CCP Central Propaganda Department in the Current Era," *Westminster Papers in Communications and Culture*, (University of Westminster, London: 2006), p. 69.

83. Anne-Marie Brady, "Guiding Hand: The Role of the CCP Central Propaganda Department in the Current Era," *Westminster Papers in Communications and Culture*, (University of Westminster, London: 2006), p. 69.

84. U.S. House of Representatives Subcommittee on Oversight and Investigations, *Hearing on Diminished Capacity: Can the FDA Assure the Safety and Security of Our Nation's Food Supply?—Part III*, testimony of David Nelson, October 11, 2007.

85. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, written statement of Oded Shenkar, July 31, 2007.

86. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, written statement of Oded Shenkar, July 31, 2007.

87. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, written statement of Oded Shenkar, July 31, 2007.

88. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, written statement of Oded Shenkar, July 31, 2007.

89. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, written statement of Oded Shenkar, July 31, 2007.

90. David Barboza, "China Closes 3 Plants on Safety Concerns," *New York Times*, July 21, 2007.

91. David Barboza, "China Finds Poor Quality on its Own Store Shelves," *New York Times*, July 5, 2007.

92. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Scott Gottlieb, July 31, 2007.

93. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Drew Thompson, July 31, 2007.

94. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Scott Gottlieb, July 31, 2007.

95. U.S.-China Economic and Security Review Commission, *Hearing on Access to Information in the People's Republic of China*, testimony of Scott Gottlieb, July 31, 2007.

96. Human Rights Watch, *Media Freedom: Section V—Harassment, Intimidation and Censorship of Chinese Journalists*, August 3, 2007. china.hrw.org/issues/media_freedom.

97. "Report: China bans media from 'swine flu' sites," *The Associated Press*, July 31, 2005.

98. David Barboza, "Virus Spreading Alarm and Pig Disease in China," *The New York Times*, August 16, 2007.

99. U.S.-China Economic and Security Review Commission, *Hearing on SARS in China: Implications for Media Control and the Economy*, testimony of Xiao Qiang, June 5, 2003.

100. Congressional Executive Commission on China, *Presentation to the CECC on Avian Influenza in China*, testimony of Erika Elvander, February 24, 2006.

101. Congressional Executive Commission on China, *Presentation to the CECC on Avian Influenza in China*, testimony of David Doorman, February 24, 2006.

THE COMMISSION'S RECOMMENDATIONS

Chapter 1—The United States-China Trade and Economic Relationship

The Relationship's Current Status and Significant Changes During 2007

1. The Commission recommends that Congress urge the Administration to press China to sign the Agreement on Government Procurement in fulfillment of a promise it made when it joined the World Trade Organization in 2001.
2. The Commission recommends that Congress enact legislation to define currency manipulation as an illegal export subsidy and allow the subsidy to be taken into account when determining penalty tariffs. In addition, Congress should amend the law to allow currency manipulation to be added to other prohibited subsidies when calculating antidumping and countervailing duty penalties.
3. The Commission recommends that Congress amend the 1988 law directing the U.S. Department of the Treasury to report biannually on "International Economic and Exchange Rate Policies." Congress should eliminate the requirement that the U.S. Department of the Treasury first determine whether a country intends to gain an export advantage before deciding that country has manipulated its currency.
4. The Commission recommends that Congress urge the Administration to bring a World Trade Organization case against China for manipulating its currency to gain an unfair trade advantage, which is a violation of the principles of the International Monetary Fund of which China is a member.
5. The Commission recommends that Congress petition the Administration to initiate a Section 301 investigation of Chinese worker rights violations in preparation for bringing a case before the World Trade Organization alleging suppression of labor rights as an unfair trade practice.

The Control of China's Economy by its Government, and the Effect on the United States

6. The Commission recommends that Congress urge the Administration to employ all necessary trade remedies authorized by World Trade Organization rules, including antidumping and countervailing duty penalties and temporary relief, to protect the U.S. economy from the Chinese government's extensive subsidies for companies in China.

7. The Commission recommends that Congress endorse the U.S. Department of Commerce decision that it has the authority to bring countervailing duty cases against non-market economies.

The Impact of Trade with China on the U.S. Defense Industrial Base

8. The Commission recommends that Congress require the U.S. Department of Defense to prepare a complete list of the country of origin of each component in every U.S. weapon system to the bottom tier.

A Case Study of the Local Impact of Trade with China: North Carolina

9. The Commission recommends that Congress increase the resources of the U.S. Department of Commerce and the Office of the U.S. Trade Representative devoted to tracking and ensuring compliance by America's trading partners with their World Trade Organization obligations.
10. The Commission recommends that Congress require U.S. companies to report to the U.S. Department of Commerce their receipt of any economic subsidy from China.
11. The Commission recommends that Congress revise the requirements to achieve standing under antidumping cases, particularly in cases where continuing sales losses in U.S. industries have driven producers into a minority status and they therefore are ineligible for standing.

Chapter 2—China's Security-Related Activities

China's Military Modernization

12. In order to slow or stop the outflow of protected U.S. technologies and manufacturing expertise to China, the Commission recommends that Congress assess the adequacy of and, if needed, provide additional funding for U.S. export control enforcement and counterintelligence efforts, specifically those tasked with detecting and preventing illicit technology transfers to China and Chinese state-sponsored industrial espionage operations.
13. The Commission recommends that Congress assess the adequacy of and, if needed, provide additional funding for military, intelligence, and homeland security programs that monitor and protect critical American computer networks and sensitive information, specifically those tasked with protecting networks from damage caused by cyber attacks.
14. The Commission recommends that Congress ensure that the U.S. Department of Defense and the National Aeronautics and Space Administration have programs to provide access to space, protect space-based assets, and maintain adequate

defense measures such as those required for rapid replacement of destroyed assets in space (the Operational Responsive Space framework).

15. The Commission recommends that Congress instruct the director of national intelligence to conduct a full assessment of U.S. intelligence capabilities vis-à-vis of the People's Republic of China, military and identify strategies for addressing any U.S. weaknesses that may be discovered as part of the assessment
16. The Commission recommends that Congress urge the Administration to engage in consultations with its allies on an alliance-based approach to China's cyber attacks.
17. The Commission recommends that Congress urge the Administration to engage China in a military dialogue on its actions and programs in cyber and space warfare to include threat reduction mechanisms, the laws of warfare, and specifically how the laws of warfare apply to the cyber and space domains.

China's Proliferation

18. The Commission recommends that Congress encourage the Administration to seek to obtain China's agreement to join the Proliferation Security Initiative (PSI).
19. The Commission recommends that Congress urge the Administration to provide expanded technical assistance to China in strengthening its export control and border control programs and capabilities, particularly including enforcement of export controls, in order to prevent proliferation.

China's Science and Technology Activities and Accomplishments

20. The Commission recommends that Congress direct the U.S. Department of Commerce to report periodically on the general R&D expenditures of U.S. companies in China, based on protected business proprietary data the Department currently collects.
21. The Commission recommends that Congress direct the U.S. Department of Defense to evaluate, and, in its *Annual Report to Congress on the Military Power of the People's Republic of China*, to report on, potential Chinese military applications of R&D conducted in China by U.S. companies.

Chapter 3—China's Energy and Environmental Policies and Activities

China's Energy Policy, Demand, and Supply

22. The Commission recommends that Congress encourage the Administration to seek greater cooperation with China in collecting and reporting energy-related data and to assist China

to improve the bureaucratic framework and governance of its energy policymaking bodies.

23. The Commission recommends that Congress urge the Administration to engage China to address global climate change/ environmental degradation and identify opportunities for further U.S.-China cooperation.

China's Environmental Situation

24. The Commission recommends that Congress urge the Administration to increase its monitoring of air quality in the western United States and its support for efforts to determine the pollution in the United States that can be traced to China.
25. The Commission recommends that Congress encourage the Administration to seek opportunities(1) with China for joint study of the economic and social costs of environmental pollution, (2) joint projects to monitor more effectively and transparently relevant environmental pollutants, and (3) joint projects to prevent pollution by use of nonpolluting energy sources and technologies and application of technologies to reduce pollution from carbon fuel combustion (such as carbon capture and sequestration techniques).

The Geostrategic Impact of China's Energy Policies and Activities

26. The Commission recommends that Congress urge the Administration to engage in a dialogue with China and other Asian nations about the physical security of their energy supplies, protection of sea lines of communication, and energy cooperation in Asia.
27. The Commission recommends that Congress urge the Administration to set as an objective for the next Strategic Economic Dialogue session developing with China a concrete agenda, set of principles, and timetable for identifying and addressing common strategic energy concerns.

Prospects for Addressing the Effects of China's Energy Consumption

28. The Commission recommends that Congress encourage the Administration to continue its current energy cooperation with China and seek opportunities to expand that cooperation at all levels of engagement, especially directed toward enhancing the monitoring and enforcement capabilities of China's energy and environmental regulatory agencies.
29. The Commission recommends that Congress encourage the sale to China of U.S. energy efficiency and clean energy technologies, especially from small- and medium-sized enterprises, and the implementation of those technologies in China.
30. The Commission recommends that Congress urge the Administration to seek further opportunities for the U.S. Environ-

mental Protection Agency to cooperate with China on the development and enforcement of energy efficient building codes to promote energy conservation and energy efficiency in new building construction.

Chapter 4—China in Asia

Taiwan

31. The Commission recommends that Congress encourage the Administration to continue to work with Taiwan to modernize its military and enhance Taiwan's capabilities for operating jointly with U.S. and allied forces, and make available to Taiwan the defensive weapons it needs for its military forces.
32. The Commission recommends that Congress urge the Administration to promote Taiwan's inclusion in international organizations where statehood is not a prerequisite such as the World Health Organization (WHO).

India

33. The Commission recommends that Members of Congress engage in dialogue with members of the Indian parliament on important issues in U.S., India, and China relations.
34. The Commission recommends that Congress encourage the Administration to engage in broader and deeper dialogue with the government of India on China's activities and influence in the region.

Hong Kong

35. The Commission recommends that Members of Congress, when visiting mainland China, also visit Hong Kong, and that Congress encourage senior Administration officials, including the Secretary of State, to make visits to Hong Kong part of their travel to China.
36. The Commission recommends that Congress urge the Administration to maintain a close watch on the development of democratic freedoms in Hong Kong, and formally protest if at any point there is a significant erosion of suffrage, media freedom, or human rights there.
37. The Commission recommends that Congress voice its disapproval of the delay in implementing universal suffrage in Hong Kong and the Hong Kong government's consideration of altering the definition of universal suffrage to include options other than "one person, one vote."
38. The Commission recommends that Congress reenact the reporting requirements of the Hong Kong Policy Act of 1992, which expired in 2007, that required the Administration to monitor and report on Hong Kong's progress toward universal suffrage, the state of the Hong Kong economy, and the relationship between Hong Kong and mainland China.

Chapter 5—China’s Media and Information Controls—The Impact in China and the United States

39. The Commission recommends that Congress increase funding for the Broadcasting Board of Governors’ radio, television, and Internet news broadcasts to the people of China, to enable those broadcasts to be expanded and to reach a greater proportion of China’s population despite jamming and other censoring methods employed by the government of the People’s Republic of China.
40. The Commission recommends that Congress urge high-level Administration officials, including Secretary of the Treasury Henry Paulson, to discuss the issue of China’s jamming of Voice of America and Radio Free Asia broadcasts during U.S.-China bilateral forums, including the Strategic Economic Dialogue (SED).
41. The Commission recommends that Congress prohibit U.S. companies from disclosing to the central or any subordinate government in the People’s Republic of China, in the absence of formal legal action by that government, information about Chinese users or authors of online content. Congress should require that a U.S. company compelled to take such actions by a government in the PRC inform the U.S. government of its actions and the government’s basis for compelling it to take those actions. A compilation of this information should be made publicly available semi-annually.
42. The Commission recommends that Congress urge the Administration to engage the government of the People’s Republic of China in a high level dialogue with the objective of obtaining its agreement to increase international access to accurate, timely, and complete information on issues potentially affecting public health outside China.

**ADDITIONAL VIEWS OF COMMISSIONERS
MARK T. ESPER, JEFFREY L. FIEDLER,
KERRI HOUSTON, MICHAEL R. WESSEL AND
LARRY M. WORTZEL**

We are writing to raise a caution flag about the integrity of the United States defense supply chain and the degree to which it may be dependent on components from China. After three years of hearing about problems related to the potential dependence of the U.S. military supply chain on components or supplies from the People's Republic of China, we think that the House and Senate Armed Services Committees should conduct classified hearings to determine the extent to which the U.S. armed forces may depend on China to be able to function.

We believe this is important because in the past two years, the U.S.-China Economic and Security Review Commission contracted for research to determine the level of dependence of the U.S. defense supply chain on China. In each case, the contractors had difficulty getting the data from U.S. Department of Defense (DoD) agencies on what components of several new weapon systems came from China. One study is still ongoing. The military departments and services, however, often are not able to respond in full, citing the need to classify their reports.

In 2004, at a hearing in Akron, Ohio, the sole American manufacturer of sonobuoys (submarine detection devices) for the United States Navy testified that unfair trading practices are allowing Chinese manufacturers of printed circuit boards used in sonobuoys to sell their product in the U.S. at a sharply discounted price. The American sonobuoy manufacturer testified that his company would lose business to Chinese competitors, and as a result, Chinese circuit boards would be installed in the sonobuoys used to detect Chinese submarines. This struck Commissioners as ironic, since the U.S. Navy had a particularly difficult time locating Chinese submarines in the Western Pacific. That situation has been addressed, and alternate suppliers are now available.

However, in hearings in 2005, the Commissioners were told that the Department of Defense "trusted" and "assured" supply of high-performance microchips is in jeopardy because of the restructuring of the U.S. commercial integrated circuit industry, some of which has moved operations to China.

In Dearborn, Michigan, in 2006, witnesses from the U.S. Army told Commissioners that the Army's capacity at the Tank and Automotive Command to surge in the event of a wider war was limited. Further, according to one witness, the Army is dependent for some materials and parts on suppliers in China.

In 2007, one witness told the Commissioners that in the near future, DoD is very likely to have to depend on supplies from China for the propellant used in some missiles, such as the Hellfire AGM-114 anti-armor missile that can be launched from helicopters. Again, we find this ironic, since in 2005, Taiwan agreed to buy 600 Hellfire missiles from the United States to defend itself in the event that the People's Republic of China carries out its threat to attack Taiwan if the Communist leadership in Beijing thinks Taiwan's democracy is moving too far toward "independence."

The Commission will continue to pursue information about the level of dependence of the U.S. defense supply chain on China in its contracted research and will report the results to Congress.

We believe, however, that the relevant committees of Congress will get more accurate and timely information if they exercise their oversight authority and conduct classified hearings on the topic.

ADDITIONAL VIEWS OF COMMISSIONER WILLIAM A. REINSCH

I have supported this year's Report because it demonstrates the Commission's continued lurch toward objectivity and thus credibility. In contrast to previous years, this Report avoids many of the odder flights of rhetoric that have amused readers in the past. This year we are more boring, but the result is a more balanced and more thoughtful Report.

As in previous years, the Commission has continued its impressive record of thorough, balanced, hearings with expert witnesses from the government and private sector. That body of work provides an in-depth set of studies on topics important to the bilateral relationship, and the hearing records contain significant amounts of data and other information of use to scholars and policy makers. Some of that is highlighted in this Report, but researchers would be advised to consult the full hearing records.

Looking at the specific chapters, this year the Commission has again attempted to examine the strength of the defense industrial base and again has run into difficulty obtaining useful data, at least as of the writing of this report. While there appears to be concern about the defense industrial base at high levels in the Defense Department, the Pentagon clearly does not have adequate procedures in place to track the sources of components and subcomponents of its systems and thus cannot come to any useful conclusions about the viability of the defense industrial base. The Commission has made a constructive recommendation on this point but has probably gone too far in suggesting record keeping to the "bottom tier," which would impose an entirely unrealistic burden on defense contractors attempting to survive in the global marketplace. There is also more than a hint that the proper policy goal is autarky, which is not only impossible, but unwise if our defense establishment is to take advantage of the latest technology and innovation globally.

One area where the Commission's recommendations are particularly thoughtful is with respect to energy and environment, where it has opted for a cooperative approach rather than the pressure tactics proposed in other chapters. Hopefully, this bit of wisdom will spread to other issue areas in future Reports.

Unfortunately, the Commission continues to reflect confusion on the issue of exchange rates. The Congress is likewise confused, but instead of providing thoughtful analysis to Members, the Commission has merely thrown existing Congressional proposals back at them without adequate analysis as to whether or not they will work. Attractive though penalties always seem to the Commission, antidumping and countervailing duties are microeconomic remedies ill-suited to a macroeconomic problem. Including the amount of currency subsidy in their calculation may provide some measure of relief for a few companies or an entire sector, but achieving an economy-wide impact would require filing thousands of cases—a development that would primarily benefit trade lawyers.

Further, some of the proposals—changing the requirements for Treasury's semi-annual currency report and the antidumping standing rules—are little more than cranky efforts to change the

rules of the game because we're not winning often enough. Even the recommendation for a multilateral approach—a WTO complaint—is the right idea, but misplaced. It is the IMF that has failed in its responsibility to deal with exchange rate misalignments, deliberate or not, and it is there that U.S. efforts should be directed.

There are also other problematic recommendations, particularly those that would require expanded corporate reporting of activities in China and would use that proprietary data for policy purposes. They betray a far too simplistic view of the ease of identifying and quantifying subsidies and research and development costs and would, I believe, impose a significant burden on companies without an offsetting benefit.

Likewise, on the vexing issue of information technology (IT) companies attempting to operate in China, the Commission has once again taken the easy way out by essentially endorsing Congressional efforts to mandate limits on their cooperation with Chinese authorities. The recommendation is not as bad as it could be, but it still leaves unexamined the question of whether the Chinese people's access to information and U.S. national security are better served by a growing U.S. IT presence there, however limited; or whether they and we are better off with greater Chinese reliance on indigenous hardware and software. Here, as elsewhere, the morally and politically correct position, which the Commission has always been quick to take, may not be the one most in our or the Chinese people's interests.

This emphasis on moral and political correctness also can be seen in the Commission's increasing focus on human rights and religious freedom. These are important concerns, and I applaud individual Commissioners' interest in them, but I hope that as the Commission's work evolves, it does not lose its focus on its fundamental mandate of national security, a mandate that distinguishes us from the Congressional-Executive Commission on China.

Last year I warned that China becoming a responsible stakeholder does not simply mean that they have to agree with us on all important issues, and I faulted last year's Report for falling into that trap. This year's Report is better on that point and reflects some recognition that we do best with China when we can explain to its leaders why a particular action is good for them rather than why it is good for us. The Report's recommendations, however, continue to reflect a lack of patience and perspective. The problems the Report identifies are real and serious, and some of them have gotten worse in the past year rather than better, but progress on them will inevitably be as Lenin suggested—a matter of two steps forward and one step backward, and sometimes the reverse. The Commission could perform a real service to Congress by making that point from time to time. Counseling patience does not mean surrendering the goal of a better and more balanced bilateral relationship; it means we have a more sophisticated understanding of how to reach it.

ADDITIONAL VIEWS OF COMMISSIONER PETER VIDENIEKS

I consider this to be an interim Report—a periodic progress Report. The final Report, the Commission’s only statute-required deliverable item, is due seven months from now—“by June 1” of 2008. I find this interim Report acceptable as such and have signed it. The Commission staff has done great work. However, as the GAO points out in its recent Report to Congress, the Commission has never submitted a Report on time.

The Commission relies heavily on a “consensus” approach in preparing its advisory Report. As we know, the term has various definitions, ranging from absolute unanimity to mere majority. Commissioner silence is at times treated as “consensus” concurrence, and some complex issues are disposed superficially and hurriedly. While the quorum for this twelve-member temporary entity is seven, the final text for this entire Report was “frozen” to be voted on without changes, and edited in four hours by just four Commissioners present at the end. Sparse attendance is typical. There is heavy reliance on testimony of panelists. The Commission for the most part plays a passive role, adds little value, and delivers as advice to Congress selective excerpts of testimony. For example, while one key panel consisted of two coal-state governors, discussing the need of national legislation to aid clean-coal technologies, not even one of the energy chapter’s 270 footnotes is attributed to their testimony. The key issue is—is the Commission forcing its “consensus” opinion on Congress, thus taking from Senators and Representatives the opportunity to evaluate differing views of important issues, and to disagree or agree as they see fit?

The Commission is subject to the Federal Advisory Committee Act (FACA). While transparency and openness are desirable, it is not logical or desirable to disclose the results of the Commission’s work (even if unclassified) to foreigners, in this case to Russians, even before the U.S. Congress sees it. The Commission is required by statute to “investigate” exclusively specific, limited aspects of the U.S.-PRC bilateral relationship. To investigate means to conduct research, and FACA is flexible with respect to research. However, the Commission takes a passive approach and chooses to edit staff work rather than to meaningfully conduct research investigations, as mandated by statute. If the Commissioners did their job as required by law, their advisory report would first go to the U.S. Congress—before it arrives at the Russian embassy.

The Report’s recommendations are generally weak. Typically they read something like this: the Commission recommends that Congress urge the Administration to conduct dialogue, or continue to monitor events, etc. Instead the Commission should recommend that U.S. Congress consider specific legislation and/or that Congress urge the Administration to take clearly defined steps. As Governors Schweitzer and Manchin testified to the Commission, the U.S. must lead by example and start soon and aggressively to have any credibility. For example, in the energy area the Commission could recommend that Congress pass: (a) legislation that establishes a national standard for mineral rights (this is a prerequisite of the fundamental mandated requirement of influencing

PRC energy policy—lead by example); (b) a carbon sequestration law (carbon sequestration is a strong candidate area for mandated joint U.S.-PRC R&D and U.S. technological assistance to the PRC); and (c) legislation that establishes a carbon policy and encourages investment in technologies such as coal-to-liquids, energy-efficient transformers, advanced solid state technology, etc.—all areas in which the U.S. can engage in joint R&D with the PRC and possibly provide technological assistance, as mandated by Congress. We cannot eliminate coal from the energy picture. While coal is king in the PRC, half of the U.S. electric power sector is fueled by coal, U.S. leads the world in possession of proven coal reserves (27%), and global oil reserves have already peaked—in order to be used, coal must be burned cleanly. The technology exists. As the West Virginia and Montana Governors testified, U.S. Congress should pass laws to make clean coal economically feasible. The Commission should advise Congress accordingly. Status quo is not an option.

Has the Congressionally established U.S.-China Economic and Security Review Commission become a mere “clearing house”—do the Commissioners no longer add value? Does the Commission merely repackage views of selected bureaucrats and academicians and pass them on to U.S. Congress as advice?

The Commission’s statutorily required advisory report is due seven months from now, by June 1, 2008. The current submission is a voluntary interim progress report, which could be incorporated in whole or in part, directly or by reference, in the final May 2008 Report. Nobody should be above the law—immigrant day laborers, telephone companies, or legislative Commissions. Amnesty to illegal border crossers, retroactive exemption from liability for privacy violation, or disregard of statutory deadlines—all are unacceptable, especially so when it comes to a Commission appointed by the law-making bodies of the land. As the result of concerns, including those set forth above, the U.S. Senate passed legislation requiring increased oversight of the Commission and term limitations for Commissioners. Given that the GAO report found potential for fraud, waste, and abuse, the Senate was right on the mark.

APPENDIX I
**UNITED STATES-CHINA ECONOMIC AND
SECURITY REVIEW COMMISSION CHARTER**

22 U.S.C. 7002 (2001)

The Commission was created on October 30, 2000 by the Floyd D. Spence National Defense Authorization Act for 2001 § 1238, Pub. L. No. 106-398, 114 STAT. 1654A-334 (2000) (codified at 22 U.S.C. § 7002 (2001), as amended by the Treasury and General Government Appropriations Act for 2002 § 645 (regarding employment status of staff) & § 648 (regarding changing annual report due date from March to June), Pub. L. No. 107-67, 115 STAT. 514 (Nov. 12, 2001); as amended by Division P of the “Consolidated Appropriations Resolution, 2003,” Pub. L. No. 108-7 (Feb. 20, 2003) (regarding Commission name change, terms of Commissioners, and responsibilities of Commission); as amended by Pub. L. No. 109-108 (enacted Nov. 22, 2005) (regarding responsibilities of Commission and applicability of FACA).

§ 7002. United States-China Economic and Security Review Commission

(a) Purposes. The purposes of this section are as follows:

(1) To establish the United States-China Economic and Security Review Commission to review the national security implications of trade and economic ties between the United States and the People’s Republic of China.

(2) To facilitate the assumption by the United States-China Economic and Security Review Commission of its duties regarding the review referred to in paragraph (1) by providing for the transfer to that Commission of staff, materials, and infrastructure (including leased premises) of the Trade Deficit Review Commission that are appropriate for the review upon the submittal of the final report of the Trade Deficit Review Commission.

(b) Establishment of United States-China Economic and Security Review Commission.

(1) In general. There is hereby established a commission to be known as the United States-China Economic and Security Review Commission (in this section referred to as the “Commission”).

(2) Purpose. The purpose of the Commission is to monitor, investigate, and report to Congress on the national security implications of the bilateral trade and economic relationship between the United States and the People’s Republic of China.

(3) Membership. The United States-China Economic and Security Review Commission shall be composed of 12 members, who shall be appointed in the same manner provided for the appointment of members of the Trade Deficit Review Commission under section

127(c)(3) of the Trade Deficit Review Commission Act (19 U.S.C. 2213 note), except that—

(A) Appointment of members by the Speaker of the House of Representatives shall be made after consultation with the chairman of the Committee on Armed Services of the House of Representatives, in addition to consultation with the chairman of the Committee on Ways and Means of the House of Representatives provided for under clause (iii) of subparagraph (A) of that section;

(B) Appointment of members by the President pro tempore of the Senate upon the recommendation of the majority leader of the Senate shall be made after consultation with the chairman of the Committee on Armed Services of the Senate, in addition to consultation with the chairman of the Committee on Finance of the Senate provided for under clause (i) of that subparagraph;

(C) Appointment of members by the President pro tempore of the Senate upon the recommendation of the minority leader of the Senate shall be made after consultation with the ranking minority member of the Committee on Armed Services of the Senate, in addition to consultation with the ranking minority member of the Committee on Finance of the Senate provided for under clause (ii) of that subparagraph;

(D) Appointment of members by the minority leader of the House of Representatives shall be made after consultation with the ranking minority member of the Committee on Armed Services of the House of Representatives, in addition to consultation with the ranking minority member of the Committee on Ways and Means of the House of Representatives provided for under clause (iv) of that subparagraph;

(E) Persons appointed to the Commission shall have expertise in national security matters and United States-China relations, in addition to the expertise provided for under subparagraph (B)(i)(I) of that section;

(F) Each appointing authority referred to under subparagraphs (A) through (D) of this paragraph shall—

(i) appoint 3 members to the Commission;

(ii) make the appointments on a staggered term basis, such that—

(I) 1 appointment shall be for a term expiring on December 31, 2003;

(II) 1 appointment shall be for a term expiring on December 31, 2004; and

(III) 1 appointment shall be for a term expiring on December 31, 2005;

(iii) make all subsequent appointments on an approximate 2-year term basis to expire on December 31 of the applicable year; and

(iv) make appointments not later than 30 days after the date on which each new Congress convenes.

(G) Members of the Commission may be reappointed for additional terms of service as members of the Commission; and

(H) Members of the Trade Deficit Review Commission as of the date of the enactment of this Act [enacted Oct. 30, 2000] shall serve as members of the United States-China Economic and Security Review Commission until such time as members are first ap-

pointed to the United States-China Economic and Security Review Commission under this paragraph.

(4) Retention of support. The United States-China Economic and Security Review Commission shall retain and make use of such staff, materials, and infrastructure (including leased premises) of the Trade Deficit Review Commission as the United States-China Economic and Security Review Commission determines, in the judgment of the members of the United States-China Economic and Security Review Commission, are required to facilitate the ready commencement of activities of the United States-China Economic and Security Review Commission under subsection (c) or to carry out such activities after the commencement of such activities.

(5) Chairman and vice chairman. The members of the Commission shall select a Chairman and Vice Chairman of the Commission from among the members of the Commission.

(6) Meetings.

(A) Meetings. The Commission shall meet at the call of the Chairman of the Commission.

(B) Quorum. A majority of the members of the Commission shall constitute a quorum for the transaction of business of the Commission.

(7) Voting. Each member of the Commission shall be entitled to one vote, which shall be equal to the vote of every other member of the Commission.

(c) Duties.

(1) Annual report. Not later than June 1 each year [beginning in 2002], the Commission shall submit to Congress a report, in both unclassified and classified form, regarding the national security implications and impact of the bilateral trade and economic relationship between the United States and the People's Republic of China. The report shall include a full analysis, along with conclusions and recommendations for legislative and administrative actions, if any, of the national security implications for the United States of the trade and current balances with the People's Republic of China in goods and services, financial transactions, and technology transfers. The Commission shall also take into account patterns of trade and transfers through third countries to the extent practicable.

(2) Contents of report. Each report under paragraph (1) shall include, at a minimum, a full discussion of the following:

(A) The portion of trade in goods and services with the United States that the People's Republic of China dedicates to military systems or systems of a dual nature that could be used for military purposes.

(B) The acquisition by the People's Republic of China of advanced military or dual-use technologies from the United States by trade (including procurement) and other technology transfers, especially those transfers, if any, that contribute to the proliferation of weapons of mass destruction or their delivery systems, or that undermine international agreements or United States laws with respect to nonproliferation.

(C) Any transfers, other than those identified under subparagraph (B), to the military systems of the People's Republic of China made by United States firms and United States-based multinational corporations.

(D) An analysis of the statements and writing of the People's Republic of China officials and officially-sanctioned writings that bear on the intentions, if any, of the Government of the People's Republic of China regarding the pursuit of military competition with, and leverage over, or cooperation with, the United States and the Asian allies of the United States.

(E) The military actions taken by the Government of the People's Republic of China during the preceding year that bear on the national security of the United States and the regional stability of the Asian allies of the United States.

(F) The effects, if any, on the national security interests of the United States of the use by the People's Republic of China of financial transactions and capital flow and currency manipulations.

(G) Any action taken by the Government of the People's Republic of China in the context of the World Trade Organization that is adverse or favorable to the United States national security interests.

(H) Patterns of trade and investment between the People's Republic of China and its major trading partners, other than the United States, that appear to be substantively different from trade and investment patterns with the United States and whether the differences have any national security implications for the United States.

(I) The extent to which the trade surplus of the People's Republic of China with the United States enhances the military budget of the People's Republic of China.

(J) An overall assessment of the state of the security challenges presented by the People's Republic of China to the United States and whether the security challenges are increasing or decreasing from previous years.

(3) Recommendations of report. Each report under paragraph (1) shall also include recommendations for action by Congress or the President, or both, including specific recommendations for the United States to invoke Article XXI (relating to security exceptions) of the General Agreement on Tariffs and Trade 1994 with respect to the People's Republic of China, as a result of any adverse impact on the national security interests of the United States.

(d) Hearings.

(1) In general. The Commission or, at its direction, any panel or member of the Commission, may for the purpose of carrying out the provisions of this section, hold hearings, sit and act at times and places, take testimony, receive evidence, and administer oaths to the extent that the Commission or any panel or member considers advisable.

(2) Information. The Commission may secure directly from the Department of Defense, the Central Intelligence Agency, and any other Federal department or agency information that the Commission considers necessary to enable the Commission to carry out its duties under this section, except the provision of intelligence information to the Commission shall be made with due regard for the protection from unauthorized disclosure of classified information relating to sensitive intelligence sources and methods or other exceptionally sensitive matters, under procedures approved by the Director of Central Intelligence.

(3) Security. The Office of Senate Security shall—

(A) provide classified storage and meeting and hearing spaces, when necessary, for the Commission; and

(B) assist members and staff of the Commission in obtaining security clearances.

(4) Security clearances. All members of the Commission and appropriate staff shall be sworn and hold appropriate security clearances.

(e) Commission personnel matters.

(1) Compensation of members. Members of the United States-China Economic and Security Review Commission shall be compensated in the same manner provided for the compensation of members of the Trade Deficit Review Commission under section 127(g)(1) and section 127(g)(6) of the Trade Deficit Review Commission Act [19 U.S.C. 2213 note].

(2) Travel expenses. Travel expenses of the United States-China Economic and Security Review Commission shall be allowed in the same manner provided for the allowance of the travel expenses of the Trade Deficit Review Commission under section 127(g)(2) of the Trade Deficit Review Commission Act [19 U.S.C. § 2213 note].

(3) Staff. An executive director and other additional personnel for the United States-China Economic and Security Review Commission shall be appointed, compensated, and terminated in the same manner provided for the appointment, compensation, and termination of the executive director and other personnel of the Trade Deficit Review Commission under section 127(g)(3) and section 127(g)(6) of the Trade Deficit Review Commission Act [19 U.S.C. § 2213 note]. The executive director and any personnel who are employees of the United States-China Economic and Security Review Commission shall be employees under section 2105 of title 5, United States Code, for purposes of chapters 63, 81, 83, 84, 85, 87, 89, and 90 of that title [language of 2001 amendment, Sec. 645].

(4) Detail of government employees. Federal Government employees may be detailed to the United States-China Economic and Security Review Commission in the same manner provided for the detail of Federal Government employees to the Trade Deficit Review Commission under section 127(g)(4) of the Trade Deficit Review Commission Act [19 U.S.C. § 2213 note].

(5) Foreign travel for official purposes. Foreign travel for official purposes by members and staff of the Commission may be authorized by either the Chairman or the Vice Chairman of the Commission.

(6) Procurement of temporary and intermittent services. The Chairman of the United States-China Economic and Security Review Commission may procure temporary and intermittent services for the United States-China Economic and Security Review Commission in the same manner provided for the procurement of temporary and intermittent services for the Trade Deficit Review Commission under section 127(g)(5) of the Trade Deficit Review Commission Act [19 U.S.C. § 2213 note].

(f) Authorization of appropriations.

(1) In general. There is authorized to be appropriated to the Commission for fiscal year 2001, and for each fiscal year thereafter, such sums as may be necessary to enable the Commission to carry out its functions under this section.

(2) Availability. Amounts appropriated to the Commission shall remain available until expended.

(g) Federal Advisory Committee Act. The provisions of the Federal Advisory Committee Act (5 U.S.C. App.) shall not apply to the Commission.

Effective date. This section shall take effect on the first day of the 107th Congress.

Amendments:

SEC. 645. (a) Section 1238(e)(3) of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (as enacted by Public Law 106–398) is amended by adding at the end the following: “The executive director and any personnel who are employees of the United States-China Economic and Security Review Commission shall be employees under section 2105 of title 5, United States Code, for purposes of chapters 63, 81, 83, 84, 85, 87, 89, and 90 of that title.” (b) The amendment made by this section shall take effect on January 3, 2001.”

SEC. 648. DEADLINE FOR SUBMISSION OF ANNUAL REPORTS BY UNITED STATES-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION. Section 1238(c)(1) of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (as enacted into law by section I of Public Law 106–398) is amended by striking “March” and inserting “June”.

Changes: Enacted into law by Division P of the “Consolidated Appropriations Resolution, 2003” Pub. L. 108–7 dated February 20, 2003:

H. J. Res. 2—

DIVISION P—UNITED STATES-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION

SECTION 1. SHORT TITLE.—This division may be cited as the “United States-China Economic and Security Review Commission”.

SEC. 2. (a) APPROPRIATIONS.—There are appropriated, out of any funds in the Treasury not otherwise appropriated, \$1,800,000, to remain available until expended, to the United States-China Economic and Security Review Commission.

(b) NAME CHANGE.—

(1) IN GENERAL.—Section 1238 of the Floyd D. Spence National Defense Authorization Act of 2001 (22 U.S.C. 7002) is amended— as follows:

In each Section and Subsection where it appears, the name is changed to the “U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION”—

(2) REFERENCES.—Any reference in any Federal law, Executive order, rule, regulation, or delegation of authority, or any document of or relating to the United States-China Security Review Commission shall be deemed to refer to the United States-China Economic and Security Review Commission.

(c) MEMBERSHIP, RESPONSIBILITIES, AND TERMS.—

(1) IN GENERAL.—Section 1238(b)(3) of the Floyd D. Spence National Defense Authorization Act of 2001 (22 U.S.C. 7002) is amended by striking subparagraph (F) and inserting the following:

“(F) each appointing authority referred to under subparagraphs (A) through (D) of this paragraph shall—

“(i) appoint 3 members to the Commission;

“(ii) make the appointments on a staggered term basis, such that—

“(I) 1 appointment shall be for a term expiring on December 31, 2003;

“(II) 1 appointment shall be for a term expiring on December 31, 2004; and

“(III) 1 appointment shall be for a term expiring on December 31, 2005;

“(iii) make all subsequent appointments on an approximate 2-year term basis to expire on December 31 of the applicable year; and

“(iv) make appointments not later than 30 days after the date on which each new Congress convenes;”.

SEC. 635. (a) Modification of Responsibilities.—Notwithstanding any provision of section 1238 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (22 U.S.C. 7002), or any other provision of law, the United States-China Economic and Security Review Commission established by subsection (b) of that section shall investigate and report exclusively on each of the following areas:

(1) PROLIFERATION PRACTICES.—The role of the People’s Republic of China in the proliferation of weapons of mass destruction and other weapons (including dual use technologies), including actions, the United States might take to encourage the People’s Republic of China to cease such practices.

(2) ECONOMIC TRANSFERS.—The qualitative and quantitative nature of the transfer of United States production activities to the People’s Republic of China, including the relocation of high technology, manufacturing, and research and development facilities, the impact of such transfers on United States national security, the adequacy of United States export control laws, and the effect of such transfers on United States economic security and employment.

(3) ENERGY.—The effect of the large and growing economy of the People’s Republic of China on world energy supplies and the role the United States can play (including joint research and development efforts and technological assistance), in influencing the energy policy of the People’s Republic of China.

(4) UNITED STATES CAPITAL MARKETS.—The extent of access to and use of United States capital markets by the People’s Republic of China, including whether or not existing disclosure and transparency rules are adequate to identify People’s Republic of China companies engaged in harmful activities.

(5) REGIONAL ECONOMIC AND SECURITY IMPACTS.—The triangular economic and security relationship among the United States, Taipei and the People’s Republic of China (including the military modernization and force deployments of the People’s Republic of China aimed at Taipei), the national budget of the People’s Republic of China, and the fiscal strength of the People’s Republic of China in relation to internal instability in the People’s Re-

public of China and the likelihood of the externalization of problems arising from such internal instability.

(6) UNITED STATES-CHINA BILATERAL PROGRAMS.—Science and technology programs, the degree of non-compliance by the People's Republic of China with agreements between the United States and the People's Republic of China on prison labor imports and intellectual property rights, and United States enforcement policies with respect to such agreements.

(7) WORLD TRADE ORGANIZATION COMPLIANCE.—The compliance of the People's Republic of China with its accession agreement to the World Trade Organization (WTO).

(8) FREEDOM OF EXPRESSION.—The implications of restrictions on speech and access to information in the People's Republic of China for its relations with the United States in the areas of economic and security policy.

(b) Applicability of Federal Advisory Committee Act.—Subsection (g) of section 1238 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 is amended to read as follows:

(g) Applicability of FACA.—The provisions of the Federal Advisory Committee Act (5 U.S.C. App.) shall apply to the activities of the Commission.

The effective date of these amendments shall take effect on the date of enactment of this Act [November 22, 2005].

APPENDIX II

BACKGROUND OF COMMISSIONERS

Carolyn Bartholomew, Chairman

Chairman Carolyn Bartholomew was reappointed to the U.S.-China Economic and Security Review Commission on December 17, 2005, by House Democratic Leader Nancy Pelosi for a two-year term expiring December 31, 2007. Ms. Bartholomew was unanimously elected as the Commission's Chairman for the 2007 report cycle.

Chairman Bartholomew worked at senior levels in the U.S. Congress, serving as Counsel, Legislative Director, and Chief of Staff to U.S. House of Representatives Democratic Leader Nancy Pelosi. She also served as a Professional Staff Member on the House Permanent Select Committee on Intelligence. Previously, she was a legislative assistant to then-U.S. Representative Bill Richardson.

In these positions, Ms. Bartholomew was integrally involved in developing U.S. policies on international affairs and security matters. She has particular expertise in U.S.-China relations, focused primarily on trade, human rights, and the proliferation of weapons of mass destruction. Chairman Bartholomew was a lead staff on legislation to establish the Department of Homeland Security and led efforts in the establishment and funding of global AIDS programs and the promotion of human rights and democratization in countries around the world. Ms. Bartholomew was a member of the first Presidential Delegation to Africa to Investigate the Impact of HIV/AIDS on Children; and a member of the Council on Foreign Relations Congressional Staff Roundtable on Asian Political and Security issues. In addition to U.S.-China relations, her areas of expertise include terrorism, trade, proliferation of weapons of mass destruction, human rights, U.S. foreign assistance programs, and international environmental issues. She also currently serves on the Board of Directors of the Kaiser Aluminum Corporation.

The Chairman received a B.A. from the University of Minnesota, an M.A. in anthropology from Duke University and J.D. from Georgetown University Law Center. She is a member of the State Bar of California.

Daniel A. Blumenthal, Vice Chairman

Vice Chairman Daniel A. Blumenthal was appointed by Senate Majority Leader Bill Frist for a two-year term expiring December 31, 2007. He was unanimously approved as Vice Chairman for the 2007 report cycle.

Daniel Blumenthal is a Resident Fellow in Asian Studies at the American Enterprise Institute for Public Policy Research. He is a

member of the Academic Advisory Group of the Congressional U.S.-China Working Group.

Previously, Mr. Blumenthal was senior director for China, Taiwan, Hong Kong, and Mongolia in the Office of the Under Secretary of Defense for International Security Affairs from March 2004–November 2004 during the first George W. Bush administration. He developed and implemented defense policy toward China, Taiwan, Hong Kong and Mongolia, during which time he received the Office of Secretary of Defense Medal for Exceptional Public Service. From January 2002–March 2004, he was County Director for China, Taiwan and Hong Kong in the Office of the Secretary of Defense, International Security Affairs.

Before his service at the Department of Defense, Mr. Blumenthal was an Associate Attorney, Corporate and Asia Practice Groups at Kelley Drye & Warren L.L.P. Earlier, he was an Editorial and Research Assistant at the Washington Institute for Near East Policy.

Mr. Blumenthal received an M.A. in International Relations and International Economics from the Johns Hopkins University School of Advanced International Studies, and a J.D. from the Duke University School of Law in 2000. He has written extensively on national security issues.

Peter T.R. Brookes

Peter Brookes, as senior Fellow at the Heritage Foundation, develops and communicates Heritage's stance on foreign policy and national security affairs through media appearances, research, published articles, congressional testimony and speaking engagements.

In addition, he is a weekly columnist for the nation's 5th largest newspaper, the *New York Post*. His column also runs in several other domestic and foreign newspapers, and on numerous news and opinion-oriented websites.

Brookes is also a contributing editor for *Armed Forces Journal* magazine, and has had over 300 articles published in over 50 newspapers, journals and magazines. He is the author of: *A Devil's Triangle: Terrorism, Weapons of Mass Destruction and Rogue States* (Rowman & Littlefield, hardback 2005, paperback 2007).

Brookes has made nearly 1,000 appearances as a commentator on TV and radio, appearing on ABC, NBC, CBS, FOX, CNN, MSNBC, CNBC, NPR, BBC, CBC, VOA, Al Hurra, and Radio Free Asia, among others. He has been quoted by many of the world's largest newspapers and magazines.

He has testified numerous times before both the U.S. Senate and House of Representatives on foreign policy, defense and intelligence issues as an administration official and as a private citizen. He is also a frequent public speaker both in the U.S. and overseas, including public diplomacy speaking tours for the U.S. State Department in Japan, Germany, Australia, Poland, Ukraine, Fiji and Papua New Guinea.

Before coming to Heritage, Brookes served in the George W. Bush administration as the Deputy Assistant Secretary of Defense for Asian and Pacific Affairs, where he was responsible for U.S. security and defense policy for 38 countries and 5 bilateral defense alliances in the Asia-Pacific region. Prior to joining the Bush administration, he worked as a Professional Staff Member with the

Committee on International Relations in the U.S. House of Representatives. He also served with the CIA's Directorate of Operations. Just prior to his CIA service, he worked for the State Department, at the United Nations, and in the private sector in the defense industry.

Brookes is a decorated military veteran, having served on active duty with the U.S. Navy in Latin America, Asia, and Middle East in aviation and intelligence billets during the Cold War. Brookes has over 1300 flight hours aboard U.S. Navy EP-3 reconnaissance aircraft. Now a retired Navy Commander, during his reserve career he served with the NSA, DIA, Naval Intelligence, the Joint Chiefs of Staff, and the Office of the Vice President, working as an intelligence analyst, strategic debriefer, Russian-language interpreter, defense attaché and associate professor at the Joint Military Intelligence College.

Brookes is currently pursuing a Doctorate at Georgetown University. He is a graduate of the U.S. Naval Academy (B.S., Engineering); the Defense Language Institute (Diploma, Russian); the Naval War College (Diploma); and the Johns Hopkins University (M.A., Government).

He has served in political positions at the local, state and national level, including being one of the drafters of the 2000 Republican foreign policy platform at the Convention in Philadelphia, and serving on Bush campaign foreign policy and veteran's advisory groups in 2004.

Brookes' awards include the Navy League Frank Knox Media Award; Joint Service Commendation Medal; Navy Commendation Medal (3 awards); Navy Achievement Medal; several naval and joint unit awards; the Defense Language Institute's Kellogg Award; the Joint Chiefs of Staff service badge; and Naval Aviation Observer wings.

Hon. C. Richard D'Amato

C. Richard D'Amato was reappointed to the U.S.-China Economic and Security Review Commission by Senate Democratic Leader Harry Reid on October 5, 2005, for a two-year term expiring December 31, 2007. He served as the Chairman and Vice Chairman of the Commission beginning in April 2001 through December 20, 2005. He is an attorney, and a member of the Maryland and DC bars. He is a former delegate to the General Assembly of the State of Maryland, (1998-2002), representing the Annapolis, Maryland, region, and served on the Appropriations Committee. He is also a retired Captain in the United States Navy Reserve, served two tours of duty in the Vietnam theatre aboard the USS KING (DLG-10), and three years as an Assistant Professor of Government at the U.S. Naval Academy. He served on the Trade Deficit Review Commission, a Congressional advisory body, as a member from 1999-2000.

He currently serves as vice president for development of Synergics, Inc., a developer of alternative energy projects, particularly wind energy. He is also a member and official presenter for Vice President Al Gore's Climate Project and serves on Maryland Governor O'Malley's newly created Commission on Climate

Change. He has accepted an invitation to become a trustee of St. Mary's College, Maryland, beginning in 2008.

From 1988–98, Commissioner D'Amato was the Democratic Counsel for the Committee on Appropriations of the United States Senate. He was responsible for coordinating and managing the annual appropriations bills and other legislation on policy and funding of U.S. defense, foreign policy, trade and intelligence matters. He served from 1980–88 as the staff director for foreign and defense policies for the Democratic Senate leader, Senator Robert C. Byrd. In this position, he supervised work on major foreign policy, national security and trade policies, and was the co-director for the Senate Arms Control Observer Group, a bipartisan leadership organization, which served as liaison with the White House on all arms control negotiations with the Soviet Union. He also served on the Senate delegation to the Kyoto negotiations on Global Warming.

Mr. D'Amato began his career as Legislative Director for Congressman James Jeffords (Ind.–VT) from 1975–78, and then as Chief of Staff for Senator Abraham Ribicoff (D–CT) until 1980.

He has been active in other aspects of public service having founded the annual Taste-of-the-Nation dinner in Annapolis as part of the nationwide "Share Our Strength" hunger relief organization, and created an annual scholarship for college bound African-American women in Anne Arundel County, Maryland. He currently serves on the boards of the Annapolis Symphony Orchestra, The Johns Hopkins Cuba Exchange Program, the Prague Institute for Strategic Studies, the University of Oxford Congressional Visitors program, and the Institute for U.S.-China relations at the University of Denver. He is a founding member of the National Sailing Hall of Fame.

Commissioner D'Amato received his B.A. (cum laude) from Cornell University in 1964, and served on the Cornell Board of Trustees' Advisory Council. He received his M.A. from the Fletcher School of Law and Diplomacy in Boston in 1967, and received his legal education from Harvard Law School and from the Georgetown University Law Center (J.D., 1980). He resides in Annapolis with his wife, Dee.

Mark T. Esper

Mark T. Esper was appointed by Senate Republican Leader Mitch McConnell for a two-year term expiring December 31, 2008. He is currently the Policy Director for the Fred Thompson 2008 Presidential Campaign. Before assuming his present position he was Executive Vice President of the Aerospace Industries Association of America, the premier trade organization representing the nation's aerospace and defense industry in Washington since 1919. In addition to his duties as the association's executive vice president, Esper was also responsible for all national security, defense, and international affairs issues at AIA as head of the Defense and International Affairs Department. In this capacity, Mr. Esper also served as co-chair of AIA's National Security, International, Defense, and Technical Operations Councils, and participated in federal advisory groups to the State and Commerce Departments.

Mr. Esper was the Director of National Security Affairs for Senate Majority Leader Bill Frist (R–TN) from May 2004 until May

2006. His portfolio in that position included all defense, foreign policy, and intelligence matters for the United States Senate, where he also worked on trade and homeland security issues. Mr. Esper was also responsible for managing the national security committees of the Senate and all national security-related issues with the Executive Branch, the House of Representatives, foreign governments, and non-governmental organizations.

From 2002 through 2004, Mr. Esper served as the Deputy Assistant Secretary of Defense for Negotiations Policy. His responsibilities as a senior official in the Department of Defense included non-proliferation policy, multilateral and bilateral arms control policy, law of armed conflict, and other international agreements. Prior to that, Mr. Esper served in a variety of positions in the United States Congress, including as a Senior Professional Staff Member responsible for national security affairs on the House Armed Services Committee, the Senate Foreign Relations Committee, the Senate Governmental Affairs Committee, and in the personal offices of Senators Fred Thompson and Chuck Hagel.

Mr. Esper is a graduate of the United States Military Academy at West Point and the John F. Kennedy School of Government at Harvard University. He is currently working on his Ph.D. in Public Policy at the George Washington University in Washington, DC, and is an associate professor in the Graduate Department of Defense and Strategic Studies at Missouri State University in Virginia.

Mr. Esper served for ten years in the U.S. Army as an Infantry Officer in a variety of assignments around the world, including Operations Desert Shield/Desert Storm in Saudi Arabia and Iraq in 1990–91, before leaving active duty to become Chief of Staff at The Heritage Foundation in Washington, DC.

He resides in northern Virginia with his wife and three children.

Jeffrey L. Fiedler

Jeffrey L. Fiedler was appointed by House Speaker-elect Nancy Pelosi for a term expiring December 31, 2007. Fiedler is President of Research Associates of America (“RAA”), a non-profit labor research organization. Previously, he was the elected President of the Food and Allied Service Trades Department, AFL–CIO (“FAST”). This constitutional department of the AFL–CIO represented 10 unions with a membership of 3.5 million in the United States and Canada. The focus of RAA, like FAST before it, is organizing and bargaining research for workers and their unions.

He served as a member of the AFL–CIO Executive Council committees on International Affairs, Immigration, Organizing, and Strategic Approaches. He is also on the Board of Directors of the Consumer Federation of America, and a member of the Council on Foreign Relations, and the Pacific Council on International Policy.

In 1992, Fiedler co-founded the Laogai Research Foundation (“LRF”), an organization devoted to studying the forced labor camp system in China. When the Foundation’s Executive Director, Harry Wu, was detained in China in 1995, Fiedler coordinated the campaign to win his release. He still serves as a director of the LRF.

Fiedler has testified on behalf of the AFL–CIO before the Senate Foreign Relations Committee, the House International Affairs

Committee and its various subcommittees, as well as the Trade Subcommittee of the House Ways and Means Committee concerning China policy. He attended three of the American Assembly conferences on China sponsored by Columbia University and has participated in a Council on Foreign Relations task force and study group on China. He has been interviewed on CBS, NBC, ABC, CNN and CNBC on China policy, international trade issues, human rights, and child labor.

A Vietnam veteran, Fiedler served with the U.S. Army in Hue in 1967–68. He received his B.A. in Political Science from Southern Illinois University. He is married with two adult children and resides in Virginia.

Kerri Houston

Often referred to as “a force of nature” by fellow free market activists, Kerri Houston is a public policy analyst and expert in coalition building and messaging for domestic and international public policy issues.

Ms. Houston was most recently vice president of policy for Frontiers of Freedom, advocating for free market solutions to a wide range of public policy reforms, political and national defense issues. She continues her affiliation with the free market think tank community as a Senior Fellow with the Institute for Liberty.

Ms. Houston also works as a public policy and political consultant specializing in coalition and stakeholder management, messaging and issue advocacy for private clients.

Appointed in January 2006 by House Speaker Dennis Hastert, Ms. Houston currently serves as a Commissioner on the U.S.-China Economic and Security Review Commission and is a Senior Analyst with the Alliance of American Manufacturing.

Prior to joining Frontiers of Freedom, Ms. Houston was national field director for the American Conservative Union and executive director of State Policy Network, a member organization of free market state-based think tanks, and director of external affairs for the Institute for Policy Innovation.

Her responsibilities have included all facets of marketing, policy research and issue advocacy for conservative think tanks, as well as acting as liaison to Capitol Hill, the White House, state legislators, and other free market policy centers in the U.S., Europe and Asia.

A strong proponent of individual and economic liberty, federalism, free trade and free markets, Ms. Houston lectures on public policy and legislative issues and the proper role of government in civil society. She has worked internationally as a trainer for the International Republican Institute.

She is a Brain Trust columnist for *Investor’s Business Daily*, and her opinion/editorials have appeared in *The Wall Street Journal*, *The Washington Times*, *The Dallas Morning News*, *Forbes* magazine, *Intellectual Ammunition*, and numerous other print, Internet and institutional publications throughout the country. Many of her editorials can be found at www.opeds.com. She is a frequent guest on talk radio nationwide, and a regular guest co-host on USA Radio Network’s “Point of View.” Ms. Houston was a frequent guest on

Politically Incorrect with Bill Maher and has appeared on FOX, MSNBC and CNBC.

She is a member of the National Paycheck Protection Working Group, Co-Chairman of Legislative Affairs for the North Texas Technology Council, and advisor to the Texas Conservative Coalition's Health and Human Services Task Force. She serves on the Board of Directors for GOPUSA.com, Citizen Outreach and sits on the Board of Advisors for The Project for California's Future run by California Republican Chairman Ron Nehring.

Ms. Houston was also nominated to serve on the President's Commission to Strengthen Social Security.

Well known for her dedication to presenting public policy in a way that will "pass the dinner table test," Ms. Houston brings a sharp wit and a practical spin to her particular areas of expertise in fiscal, cultural and international policy.

Hon. William A. Reinsch

Commissioner William A. Reinsch was reappointed to the U.S.-China Economic and Security Review Commission by Senate Democratic Leader Harry Reid on October 5, 2005, for a two-year term expiring December 31, 2007.

On April 2, 2001, Commissioner Reinsch joined the National Foreign Trade Council as President. The council, founded in 1914, is the only business organization dedicated solely to trade policy, export finance, international tax, and human resource issues. The organization represents some 300 companies through its offices in New York and Washington, DC.

Prior to joining the National Foreign Trade Council, Reinsch served as Under Secretary for Export Administration in the U.S. Department of Commerce. As head of the Bureau of Export Administration (subsequently renamed the Bureau of Industry and Security), he was charged with administering and enforcing the export control policies of the U.S. government, as well as its anti-boycott laws. In addition, the bureau is part of an interagency team helping Russia and other newly emerging nations develop effective export control systems and convert their defense industries to civilian production. Through its Office of Strategic Industries and Economic Security, the bureau is also responsible for monitoring and protecting the health of U.S. industries critical to our national security and defense industrial base and assisting in domestic defense conversion efforts. Major accomplishments during his tenure included: refocusing controls in light of economic globalization, most notably on high-performance computers, microprocessors, encryption, and other items; the first complete revision of the Export Administration regulations in over forty years; revising the interagency process for reviewing applications; and permitting electronic filing of applications over the Internet.

From 1991 through 1993, Commissioner Reinsch was a senior Legislative Assistant to Senator John D. Rockefeller IV, responsible for the senator's work on trade, international economic policy, foreign affairs, and defense. He also provided staff support for Senator Rockefeller's related efforts on the Finance Committee and the Commerce, Science, and Transportation Committee.

From 1977 to 1991, Commissioner Reinsch served on the staff of the late Senator John Heinz as Chief Legislative Assistant, focusing on foreign trade and competitiveness policy issues. During that period, Senator Heinz was either Chairman or ranking minority member of the Banking Committee's Subcommittee on International Finance. He was also a member of the International Trade Subcommittee of the Finance Committee. Commissioner Reinsch provided staff support for the Senator on both subcommittees, which included participation in five revisions of the Export Administration Act and work on four major trade bills. Prior to 1977, Commissioner Reinsch was a Legislative Assistant to Representatives Richard Ottinger and Gilbert Gude, acting Staff Director of the House Environmental Study Conference, and a teacher in Maryland.

During his tenure as Under Secretary, Commissioner Reinsch delivered more than two hundred speeches and testified fifty-three times before various committees of Congress. His publications include "Why China Matters to the Health of the U.S. Economy," in *Economics and National Security: The Case of China*, 2002; "The Role and Effectiveness of U.S. Export Control Policy in the Age of Globalization," *The Monitor* (Center for International Trade and Security: Spring 2000); "Export Controls in the Age of Globalization," *The Monitor* (Center for International Trade and Security: Summer 1999); "Should Uncle Sam Control U.S. Technology Exports?" *Insight Magazine*, September 8, 1997; "Encryption Policy Strikes a Balance," *Journal of Commerce*, March 5, 1997; "Building a New Economic Relationship with Japan," in I.M. Destler and Yankelovich, D., eds., *Beyond the Beltway: Engaging the Public in U.S. Foreign Policy* (W.W. Norton: April 1994).

In addition to his legislative work, Commissioner Reinsch served as an adjunct associate professor at the University of Maryland University College Graduate School of Management and Technology, teaching a course in international trade and trade policy. He is also a member of the Boards of the Middle East Institute and of the Executive Council on Diplomacy.

Commissioner Reinsch received a B.A. degree in International Relations from the Johns Hopkins University and an M.A. degree from the Johns Hopkins School of Advanced International Studies. He is married with two children and lives in Bethesda, Maryland.

Hon. Dennis Clarke Shea

Dennis Shea was appointed to the U.S.-China Economic and Security Review Commission on February 17, 2007 by Senate Republican Leader Mitch McConnell for a term expiring on December 31, 2008.

An attorney with more than 20 years of experience in government and public policy, Mr. Shea began his career as a corporate lawyer at Skadden, Arps, Slate, Meagher & Flom. In 1988, he joined the Office of Senate Republican Leader Bob Dole as counsel and later became the Office's deputy chief of staff. In these capacities, he advised Senator Dole and other Republican Senators on a broad range of domestic policy issues, was involved in the drafting of numerous pieces of legislation, and was recognized as one of the most influential staffers on Capitol Hill. Mr. Shea's service in the

Office of the Senate Republican Leader was interrupted in 1992, when he ran for Congress in New York's 7th Congressional District after receiving the Republican and Conservative Party nominations.

In 1995 and 1996, Mr. Shea continued to help shape the national public policy debate while serving as director of policy for the Dole for President campaign.

Following the 1996 presidential election, Mr. Shea worked in the private sector, providing legislative and public affairs counsel to Fortune 500 companies, major U.S. financial institutions, professional associations, and children's hospitals, while employed at BKSH & Associates and Verner, Liipfert, Bernhard, McPherson and Hand. Mr. Shea also served as a consultant to the American Enterprise Institute and The Brookings Institution on a report that outlined recommendations for reforming the independent counsel statute.

In 2003, Mr. Shea was named the Executive Director of the President's Commission on the United States Postal Service. Many of the Commission's recommendations were adopted as part of postal reform legislation recently enacted by Congress and signed into law. In 2004, Mr. Shea was nominated by President George W. Bush and later confirmed as Assistant Secretary for Policy Development and Research ("PD&R") at the U.S. Department of Housing and Urban Development. As the head of the PD&R office, Mr. Shea led a team responsible for conducting much of the critical economic analysis necessary to support HUD's mission. In 2005, Mr. Shea left HUD to serve as senior advisor to Senator Elizabeth Dole in her capacity as chair of the National Republican Senatorial Committee.

Mr. Shea received a J.D., an M.A. in American History, and a B.A. in Government, all from Harvard University. His commentaries and articles have appeared on MSNBC.com and in *National Review*, *The Washington Post*, *The Washington Times* and the *Harvard Journal on Legislation*, among others.

Mr. Shea is admitted to the bar in New York and the District of Columbia.

Peter Videnieks

Commissioner Videnieks was appointed by Senate Majority Leader Harry Reid on January 12, 2007, for a two-year term expiring December 31, 2008.

Prior to his appointment, Commissioner Videnieks served on the staff of Senator Robert C. Byrd (D-WVA), President Pro Tempore of the United States Senate and Chairman of the U.S. Senate Appropriations Committee, as an advisor on international affairs and energy issues. He also served on the staffs of the U.S. Trade Deficit Review Commission and the U.S.-China Economic and Security Review Commission. Mr. Videnieks was previously a contracting officer for NASA, the Justice Department, and the U.S. Customs Service, where he was Division Director. He has also been an IRS revenue officer. He holds degrees from the University of Maryland (B.A. economics) and the George Washington University (M.S.A. with concentration in procurement and contracting). Mr. Videnieks was born in Latvia and lives with his wife Barbara on a farm in

Northern Virginia. His language skills are: Latvian, Spanish, and German.

Michael R. Wessel

Commissioner Michael R. Wessel is an original member of the U.S.-China Economic and Security Review Commission and was reappointed by House Democratic Leader Nancy Pelosi for a two-year term expiring December 31, 2008.

Commissioner Wessel is President of The Wessel Group Inc., a public affairs consulting firm offering expertise in government, politics, and international affairs. He was formerly the Executive Vice President at the Downey McGrath Group, Inc. He served on the staff of House Democratic Leader Richard A. Gephardt for more than twenty years, leaving his position as General Counsel in March 1998. In addition to his duties as General Counsel, Commissioner Wessel was Mr. Gephardt's chief policy advisor, strategist, and negotiator. He was responsible for the development, coordination, management, and implementation of the Democratic Leader's overall policy and political objectives, with specific responsibility for international trade, finance, economics, labor, and taxation.

During his more than twenty years on Capitol Hill, Commissioner Wessel served in a number of positions: He was Mr. Gephardt's principal Ways and Means aide, where he developed and implemented numerous tax and trade policy initiatives. He participated in the enactment of every major trade policy initiative from 1978 to his departure in 1998. In the late 1980s, he was the Executive Director of the House Trade and Competitiveness Task Force, where he was responsible for the Democrats' trade and competitiveness agenda as well as overall coordination of the Omnibus Trade and Competitiveness Act of 1988.

He was intimately involved in the development of comprehensive tax reform legislation in the early 1980s and every major tax bill during his tenure. Beginning in 1989, he became the principal advisor to the Democratic Leadership on economic policy matters and served as tax policy coordinator to the 1990 budget summit. In 1995, he developed the 10 percent Tax Plan, a comprehensive tax reform initiative that would enable roughly four out of five taxpayers to pay no more than a ten percent rate in federal income taxes. It became the principal Democratic tax reform alternative. In 1988, he served as National Issues Director to Gephardt's Presidential campaign. During the 1992 Clinton/Gore campaign, he assisted on a broad range of issues and served as a Senior Policy Advisor to the Clinton/Gore transition office. In 2004 he was a senior policy advisor to the Gephardt for President campaign and later co-chaired the Trade Policy Group for the Kerry-Edwards campaign.

He has coauthored a number of articles with Democratic Leader Gephardt and a book, *An Even Better Place: America in the 21st Century* (Public Affairs: 1999). Commissioner Wessel served as a member of the U.S. Trade Deficit Review Commission in 1999–2000, a congressionally created commission charged with studying the nature, causes and consequences of the U.S. merchandise trade and current account deficits. He also currently serves as a member on the Board of Directors of the Goodyear Tire and Rubber Co., one of the world's largest tire companies.

Commissioner Wessel holds a B.A. and a J.D. from George Washington University. He is a member of the bar of the District of Columbia and Pennsylvania and is a member of the Council on Foreign Relations. He and his wife Andrea have four children.

Larry M. Wortzel, Ph.D.

Larry M. Wortzel was reappointed by House Speaker J. Dennis Hastert on December 8, 2006 for a third term expiring December 31, 2008. Commissioner Wortzel served as Chairman for the 2006 report cycle.

He previously served as the Director of the Asian Studies Center and Vice President for foreign policy at the Heritage Foundation. A leading authority on China, Asia, national security, and military strategy, Commissioner Wortzel had a distinguished thirty-two-year career in the U.S. armed forces. His last military position was as director of the Strategic Studies Institute of the U.S. Army War College.

Following three years in the Marine Corps, Commissioner Wortzel enlisted in the U.S. Army in 1970. His first assignment with the Army Security Agency took him to Thailand, where he focused on Chinese military communications in Vietnam and Laos. Within three years, he had graduated Infantry Officer Candidate School, as well as both Airborne and Ranger schools. After serving four years as an infantry officer, he shifted to military intelligence. Wortzel traveled regularly throughout Asia while serving the U.S. Pacific Command as a political-military affairs analyst from 1978 to 1982. The following year he attended the National University of Singapore, where he studied advanced Chinese and traveled in China and Southeast Asia. He next worked for the Under Secretary of Defense for Policy, developing counterintelligence programs to protect emerging defense technologies from foreign espionage. In addition, he managed programs to gather foreign intelligence for the Army Intelligence and Security Command.

From 1988 to 1990, Commissioner Wortzel was Assistant Army Attaché at the U.S. Embassy in China, where he witnessed and reported on the Tiananmen Massacre. After assignments as an Army strategist and managing Army intelligence officers, he returned to China in 1995 as the Army Attaché. In December 1997, he became a faculty member of the U.S. Army War College, serving as director of the Strategic Studies Institute. He retired from the Army as a colonel.

Commissioner Wortzel's books include *Class in China: Stratification in a Classless Society* (Greenwood Press: 1987), *China's Military Modernization: International Implications* (Greenwood: 1988), *The Chinese Armed Forces in the 21st Century* (Carlisle, PA: 1999), and *Dictionary of Contemporary Chinese Military History* (Greenwood: 1999). He regularly publishes articles on Asian security matters.

A graduate of the Armed Forces Staff College and the U.S. Army War College, Commissioner Wortzel earned his B.A. from Columbus College, Georgia, and his M.A. and Ph.D. from the University of Hawaii. He and his wife, Christine, have two married sons and two grandchildren.

APPENDIX III

PUBLIC HEARINGS OF THE COMMISSION

<p>Full transcripts and written testimonies are available online at the Commission's Website: www.uscc.gov.</p>

February 1-2, 2007: Public Hearing on "The U.S.-China Relationship: Economics and Security in Perspective," Washington, DC

Commissioners present: Carolyn Bartholomew, Chairman (Hearing Co-Chair); Daniel A. Blumenthal, Vice Chairman (Hearing Co-Chair); Peter T.R. Brookes; Hon. C. Richard D'Amato; Jeffrey L. Fiedler; Kerri Houston; Hon. William A. Reinsch; Peter Videnieks; Michael R. Wessel; Larry M. Wortzel.

Congressional perspectives: Hon. J. Randy Forbes, U.S. Congressman from the state of Virginia; Hon. Ben Cardin, U.S. Senator from the state of Maryland; Hon. Carl Levin, U.S. Senator from the state of Michigan; Hon. Lindsey Graham, U.S. Senator from the state of South Carolina; Hon. Sherrod Brown, U.S. Senator from the state of Ohio.

Witnesses: Hon. Richard Lawless, U.S. Department of Defense; David L. Pumphrey, U.S. Department of Energy; James Mann, Johns Hopkins University; Philip Saunders, Ph.D., National Defense University; Thea Lee, AFL-CIO; Grant Aldonas, Center for Strategic and International Studies; Peter Navarro, Ph.D., University of California Irvine; Thomas P. Ehrhard, Ph.D., Center for Strategic and Budgetary Assessments; Colonel Charles Hooper, Naval Postgraduate School; Kenneth Allen, The Center for Naval Analysis Corporation; Edward Friedman, Ph.D., University of Wisconsin; Shiping Hua, Ph.D., University of Louisville; Alan M. Wachman, Ph.D., Tufts University; Thomas J. Christensen, Ph.D., U.S. Department of State; Robert Dohner, Ph.D., U.S. Department of the Treasury.

March 29-30, 2007: Public Hearing on "China's Military Modernization and Its Impact on the United States and the Asia-Pacific," Washington, DC

Commissioners present: Carolyn Bartholomew, Chairman; Daniel A. Blumenthal, Vice Chairman; Peter T.R. Brookes; Hon. C. Richard D'Amato; Mark T. Esper; Jeffrey L. Fiedler; Hon. William A. Reinsch (Hearing Co-Chair); Hon. Dennis C. Shea; Peter Videnieks; Michael R. Wessel; Larry M. Wortzel (Hearing Co-Chair).

Congressional perspectives: Hon. Dana Rohrabacher, U.S. Congressman from the state of California; Hon. Madeleine Bordallo, U.S. Congresswoman from the territory of Guam; Hon. Tim Ryan, U.S. Congressman from the state of Ohio; Hon. Duncan Hunter, U.S. Congressman from the state of California.

Witnesses: William J. Schneider, Jr., Ph.D., Defense Science Board; Michael G. Vickers, Center for Strategic and Budgetary Assessments; Derek S. Reveron, Ph.D., U.S. Naval War College; Robert J. Bunker, Ph.D., Counter-OPFOR Corporation; General James E. Cartwright, U.S. Strategic Command; Andrew S. Erickson, Ph.D., U.S. Naval War College; Cortez A. Cooper, III, Hicks and Associates, Inc.; RADM (Ret.) Eric A. McVadon, The Institute for Foreign Policy Analysis, Inc.; Bernard D. Cole, Ph.D., National War College; Mark Cozad, Defense Intelligence Agency; Ehsan Ahrari, Ph.D., Asia-Pacific Center for Security Studies; James A. Lewis, Ph.D., Center for Strategic and International Studies; Michael P. Pillsbury, Ph.D., Consultant; Eric D. Hagt, World Security Institute; Dean Cheng, The Center for Naval Analysis Corporation; Mary C. Fitzgerald, Hudson Institute.

May 24–25, 2007: Public Hearing on the “Extent of the Government’s Control of China’s Economy, and Implications for the United States,” Washington, DC

Commissioners present: Carolyn Bartholomew, Chairman; Peter T.R. Brookes; Hon. C. Richard D’Amato; Mark T. Esper; Jeffrey L. Fiedler (Hearing Co-Chair); Kerri Houston (Hearing Co-Chair); Hon. William A. Reinsch; Hon. Dennis C. Shea; Peter Videnieks; Michael Wessel (Hearing Co-Chair).

Congressional perspectives: Hon. Donald A. Manzullo, U.S. Congressman from the state of Illinois; Hon. Carolyn C. Kilpatrick, U.S. Congresswoman from the state of Michigan; Hon. Walter B. Jones, U.S. Congressman from the state of North Carolina.

Witnesses: Barry Naughton, Ph.D., University of California San Diego; Clyde Prestowitz, Economic Strategy Institute; Scott Kennedy, Ph.D., University of Indiana Bloomington; George T. Haley, Ph.D., University of New Haven; Thomas R. Howell, Dewey Ballantine LLP; David M. Marchick, Covington & Burling LLP; Brad Setser, Ph.D., Roubini Global Economics; Daniel Rosen, China Strategic Advisory; Barry Solarz, American Iron and Steel Institute; David Pritchard, Ph.D., State University of New York Buffalo.

June 14–15, 2007: Public Hearing on “China’s Energy Consumption and Opportunities for U.S.-China Cooperation to Address the Effects of China’s Energy Use,” Washington, DC

Commissioners present: Carolyn Bartholomew, Chairman; Daniel A. Blumenthal, Vice Chairman (Hearing Co-Chair); Peter T.R. Brookes; Hon. C. Richard D’Amato (Hearing Co-Chair); Jeffrey L. Fiedler; Kerri Houston; Hon. William A. Reinsch; Hon. Dennis C. Shea (Hearing Co-Chair); Peter Videnieks (Hearing Co-Chair).

Congressional perspectives: Hon. Roscoe Bartlett, U.S. Congressman from the state of Maryland.

Gubernatorial perspectives: Hon. Joe Manchin, Governor of the state of West Virginia; Hon. Brian Schweitzer, Governor of the state of Montana.

Witnesses: Hon. Karen Harbert, U.S. Department of Energy; Hon. Judith E. Ayres, U.S. Environmental Protection Agency; Jane C.S. Long, Ph.D., Lawrence Livermore National Laboratory; Lee Schipper, Ph.D., World Resources Institute; Saad Rahim, PFC Energy; Trevor Houser, China Strategic Advisory LLC; James Holmes, Ph.D., Naval War College; Toshi Yoshihara, Ph.D., Naval War College; Mikkal Herberg, National Bureau of Asian Research; Jennifer Turner, Ph.D., Woodrow Wilson International Center for Scholars; Mun S. Ho, Ph.D., Resources for the Future; Barbara Finamore, National Resources Defense Council; Jeffrey Logan, Ph.D., World Resources Institute; Thomas Donnelly, American Enterprise Institute; David Helvey, U.S. Department of Defense; John Sie, University of Denver; Kelly Sims Gallagher, Ph.D., Harvard University; Wayne L. Rogers, Sonnenschein, Nath & Rosenthal, LLP; S.T. Hsieh, Ph.D., Tulane University; Wei-ping Pan, Ph.D., Western Kentucky University; Michael J. Mudd, FutureGen Alliance; Elizabeth Economy, Ph.D., Council on Foreign Relations; Mark Levine, Ph.D., Lawrence Berkeley National Laboratory.

July 12–13, 2007: Public Hearing on “China’s Proliferation and the Impact of Trade Policy on Defense Industries in the United States and China,” Washington, DC

Commissioners present: Carolyn Bartholomew, Chairman; Daniel A. Blumenthal, Vice Chairman; Peter T.R. Brookes (Hearing Co-Chair); Kerri Houston; Hon. William A. Reinsch; Peter Videnieks; Michael Wessel (Hearing Co-Chair); Larry M. Wortzel.

Congressional perspectives: Hon. Thad McCotter, U.S. Congressman from the state of Michigan; Hon. Duncan Hunter, U.S. Congressman from the state of California.

Witnesses: Hon. Donald Mahley, U.S. Department of State; David Sedney, U.S. Department of Defense; Jing-dong Yuan, Ph.D., Monterey Institute of International Studies; Brad Roberts, Ph.D., Institute for Defense Analyses; Gary K. Bertsch, Ph.D., University of Georgia; Joseph Cirincione, Center for American Progress; William C. Greenwalt, U.S. Department of Defense; Rear Admiral Kathleen M. Dussault, U.S. Department of Defense; Tina Ballard, U.S. Department of Defense; Terry Jaggars, U.S. Department of Defense; Tai Ming Cheung, Ph.D., University of California San Diego Institute on Global Conflict and Cooperation; James Mulvenon, Ph.D., Defense Group, Inc.; Michael Danis, Defense Intelligence Agency; Owen Herrstadt, International Association of Machinists and Aerospace; William Hawkins, U.S. Business and Industry Council.

July 31, 2007: Public Hearing on “Access to Information in the People’s Republic of China,” Washington, DC

Commissioners present: Carolyn Bartholomew, Chairman (Hearing Co-Chair); Peter T.R. Brookes; Hon. C. Richard D’Amato; Jeffrey L. Fiedler; Kerri Houston (Hearing Co-Chair); Hon. William A. Reinsch; Hon. Dennis C. Shea; Peter Videnieks; Michael R. Wessel; Larry M. Wortzel.

Congressional perspectives: Hon. Alcee Hastings, U.S. Congressman from the state of Florida; Hon. Thad McCotter, U.S. Congressman from the state of Michigan; Hon. Frank Wolf, U.S. Congressman from the state of Virginia; Hon. Tom Harkin, U.S. Congressman from the state of Indiana.

Witnesses: Jay Henderson, Voice of America; Dan Southerland, Radio Free Asia; Ashley Esarey, Ph.D., Middlebury College; Xiao Qiang, University of California Berkeley; He Qinglian, Human Rights in China; Barrett McCormick, Ph.D., Marquette University; Drew Thompson, Nixon Center; Scott Gottlieb, MD, American Enterprise Institute; Oded Shenkar, Ph.D., Ohio State University.

September 6, 2007: Public Hearing on “China’s Impact on the North Carolina Economy: Winners and Losers,” Chapel Hill, NC

Commissioners present: Carolyn Bartholomew, Chairman; Jeffrey L. Fiedler (Hearing Co-Chair); Kerri Houston (Hearing Co-Chair); Peter Videnieks; Michael R. Wessel; Larry M. Wortzel.

Witnesses: Rick L. Weddle, Research Triangle Park Foundation; Patrick J. Conway, Ph.D., University of North Carolina; Gary Gereffi, Ph.D., Duke University; Betty McGrath, North Carolina Employment Security Commission; Harris Raynor, UNITE HERE; Darryl Jackson, United Steelworkers Local 959; Michael Chen, Red Hat Software; Wyatt Bassett, Vaughan-Bassett Furniture; James Chesnutt, National Spinning Co., Inc.; H. James Owen, Ph.D., Piedmont Community College; Thomas J. White, North Carolina Department of Commerce.

**APPENDIX IV–A
LIST OF WITNESSES TESTIFYING BEFORE
THE COMMISSION
2007 Hearings**

Full transcripts and written testimonies are available online at
the Commission’s Website: www.uscc.gov.

Alphabetical Listing of Panelists Testifying before USCC

Panelist Name	Panelist Affiliation	USCC Hearing
Ahrari, Ehsan	Asia-Pacific Center for Security Studies	March 29–30, 2007
Aldonas, Grant	Center for Strategic and International Studies	February 1–2, 2007
Allen, Kenneth	The Center for Naval Analysis Corporation	February 1–2, 2007
Ayres, Judith E.	U.S. Environmental Protection Agency	June 14–15, 2007
Ballard, Tina	U.S. Department of Defense	July 12–13, 2007
Bartlett, Roscoe	U.S. Congressman from the state of Maryland	June 14–15, 2007
Bassett, Wyatt	Vaughan-Bassett Furniture	September 6, 2007
Bertsch, Gary K.	University of Georgia	July 12–13, 2007
Bordallo, Madeleine	U.S. Congresswoman from the territory of Guam	March 29–30, 2007
Brown, Sherrod	U.S. Senator from the state of Ohio	February 1–2, 2007
Bunker, Robert J.	Counter-OPFOR Corporation	March 29–30, 2007
Cardin, Benjamin	U.S. Senator from the state of Maryland	February 1–2, 2007
Cartwright, James E.	U.S. Strategic Command	March 29–30, 2007
Chen, Michael	Red Hat Software	September 6, 2007
Cheng, Dean	The Center for Naval Analysis Corporation	March 29–30, 2007
Chesnutt, James	National Spinning Co., Inc.	September 6, 2007

**Alphabetical Listing of Panelists Testifying before USCC—
Continued**

Panelist Name	Panelist Affiliation	USCC Hearing
Cheung, Tai Ming	University of California San Diego	July 12–13, 2007
Christensen, Thomas J.	U.S. Department of State	February 1–2, 2007
Cirincione, Joseph	Center for American Progress	July 12–13, 2007
Cole, Bernard D.	National War College	March 29–30, 2007
Conway, Patrick J.	University of North Carolina	September 6, 2007
Cooper, Cortez A.	Hicks and Associates, Inc.	March 29–30, 2007
Cozad, Mark	Defense Intelligence Agency	March 29–30, 2007
Danis, Michael	Defense Intelligence Agency	July 12–13, 2007
Dohner, Robert	U.S. Department of the Treasury	February 1–2, 2007
Donnelly, Thomas	American Enterprise Institute	June 14–15, 2007
Dussault, Kathleen M.	U.S. Department of Defense	July 12–13, 2007
Economy, Elizabeth	Council on Foreign Relations	June 14–15, 2007
Ehrhard, Thomas P.	Center for Strategic and Budgetary Assessments	February 1–2, 2007
Erickson, Andrew S.	U.S. Naval War College	March 29–30, 2007
Esarey, Ashley	Middlebury College	July 31, 2007
Finamore, Barbara	National Resources Defense Council	June 14–15, 2007
Fitzgerald, Mary C.	Hudson Institute	March 29–30, 2007
Forbes, J. Randy	U.S. Congressman from the state of Virginia	February 1–2, 2007
Friedman, Edward	University of Wisconsin	February 1–2, 2007
Gallagher, Kelly Sims	Harvard University	June 14–15, 2007
Gereffi, Gary	Duke University	September 6, 2007
Gottlieb, Scott	American Enterprise Institute	July 31, 2007
Graham, Lindsey	U.S. Senator from the state of South Carolina	February 1–2, 2007
Greenwalt, William C.	U.S. Department of Defense	July 12–13, 2007
Hagt, Eric D.	World Security Institute	March 29–30, 2007
Haley, Geoge T.	University of New Haven	May 24–25, 2007
Harbert, Karen	U.S. Department of Energy	June 14–15, 2007
Harkin, Tom	U.S. Congressman from the state of Indiana	July 31, 2007

**Alphabetical Listing of Panelists Testifying before USCC—
Continued**

Panelist Name	Panelist Affiliation	USCC Hearing
Hastings, Alcee	U.S. Congressman from the state of Florida	July 31, 2007
Hawkins, William	U.S. Business and Industry Council	July 12–13, 2007
He, Qinglian	Human Rights in China	July 31, 2007
Helvey, David	U.S. Department of Defense	June 14–15, 2007
Henderson, Jay	Voice of America	July 31, 2007
Herberg, Mikkal	National Bureau of Asian Research	June 14–15, 2007
Herrnstadt, Owen	International Association of Machinists and Aerospace	July 12–13, 2007
Ho, Mun S.	Resources for the Future	June 14–15, 2007
Holmes, James	Naval War College	June 14–15, 2007
Hooper, Charles	Naval Postgraduate School	February 1–2, 2007
Houser, Trevor	China Strategic Advisory, LLC	June 14–15, 2007
Howell, Thomas R.	Dewey Ballantine, LLP	May 24–25, 2007
Hsieh, S.T.	Tulane University	June 14–15, 2007
Hua, Shiping	University of Louisville	February 1–2, 2007
Hunter, Duncan	U.S. Congressman from the state of California	March 29–30, 2007 July 12–13, 2007
Jackson, Darryl	United Steel Workers Local 959	September 6, 2007
Jaggers, Terry	U.S. Department of Defense	July 12–13, 2007
Jones, Walter B.	U.S. Congressman from the state of North Carolina	May 24–25, 2007
Kennedy, Scott	University of Indiana Bloomington	May 24–25, 2007
Kilpatrick, Carolyn C.	U.S. Congresswoman from the state of Michigan	May 24–25, 2007
Lawless, Richard	U.S. Department of Defense	February 1–2, 2007
Lee, Thea	AFL–CIO	February 1–2, 2007
Levin, Carl	U.S. Senator from the state of Michigan	February 1–2, 2007
Levine, Mark	Lawrence Berkeley National Laboratory	June 14–15, 2007
Lewis, James A.	Center for Strategic and International Studies	March 29–30, 2007
Logan, Jeffrey	World Resources Institute	June 14–15, 2007

**Alphabetical Listing of Panelists Testifying before USCC—
Continued**

Panelist Name	Panelist Affiliation	USCC Hearing
Long, Jane C.S.	Lawrence Livermore National Laboratory	June 14–15, 2007
Mahley, Donald	U.S. Department of State	July 12–13, 2007
Manchin, Joe	Governor of the state of West Virginia	June 14–15, 2007
Mann, James	Johns Hopkins University	February 1–2, 2007
Manzullo, Donald A.	U.S. Congressman from the state of Illinois	May 24–25, 2007
Marchick, David M.	Covington & Burling LLP	May 24–25, 2007
McCormick, Barrett	Marquette University	July 31, 2007
McCotter, Thadeus	U.S. Congressman from the state of Michigan	July 12–13, 2007 July 31, 2007
McGrath, Betty	North Carolina Employment Security Commission	September 6, 2007
McVadon, Eric A.	The Institute for Foreign Policy Analysis, Inc.	March 29–30, 2007
Mudd, Michael J.	FutureGen Alliance	June 14–15, 2007
Mulvenon, James	Defense Group, Inc.	July 12–13, 2007
Naughton, Barry	University of California San Diego	May 24–25, 2007
Navarro, Peter	University of California Irvine	February 1–2, 2007
Owen, H. James	Piedmont Community College	September 6, 2007
Pan, Wei-ping	Western Kentucky University	June 14–15, 2007
Pillsbury, Michael P.	Consultant	March 29–30, 2007
Prestowitz, Clyde	Economic Strategy Institute	May 24–25, 2007
Pritchard, David	State University of New York Buffalo	May 24–25, 2007
Pumphrey, David L.	U.S. Department of Energy	February 1–2, 2007
Rahim, Saad	PFC Energy	June 14–15, 2007
Raynor, Harris	UNITE HERE	September 6, 2007
Reveron, Derek S.	U.S. Naval War College	March 29–30, 2007
Roberts, Brad	Institute for Defense Analyses	July 12–13, 2007
Rogers, Wayne L.	Sonnenschein, Nath & Rosenthal LLP	June 14–15, 2007
Rohrabacher, Dana	U.S. Congressman from the state of California	March 29–30, 2007

**Alphabetical Listing of Panelists Testifying before USCC—
Continued**

Panelist Name	Panelist Affiliation	USCC Hearing
Rosen, Daniel	China Strategic Advisory	May 24–25, 2007
Ryan, Tim	U.S. Congressman from the state of Ohio	March 29–30, 2007
Saunders, Phillip	National Defense University	February 1–2, 2007
Schipper, Lee	World Resources Institute	June 14–15, 2007
Schneider, William J.	Defense Science Board	March 29–30, 2007
Schweitzer, Brian	Governor of the state of Montana	June 14–15, 2007
Sedney, David	U.S Department of Defense	July 12–13, 2007
Setser, Brad	Roubini Global Economics	May 24–25, 2007
Shenkar, Oded	Ohio State University	July 31, 2007
Sie, John	University of Denver	June 14–15, 2007
Solarz, Barry	American Iron and Steel Institute	May 24–25, 2007
Southerland, Dan	Radio Free Asia	July 31, 2007
Thompson, Drew	The Nixon Center	July 31, 2007
Turner, Jennifer	Woodrow Wilson International Center for Scholars	June 14–15, 2007
Vickers, Michael G.	Center for Strategic and Budgetary Assessments	March 29–30, 2007
Wachman, Alan	Tufts University	February 1–2, 2007
Weddle, Rick L.	Research Triangle Park Foundation	September 6, 2007
White, Thomas J.	North Carolina Department of Commerce	September 6, 2007
Wolf, Frank	U.S. Congressman from the state of Virginia	July 31, 2007
Xiao, Qiang	University of California Berkeley	July 31, 2007
Yoshihara, Toshi	Naval War College	June 14–15, 2007
Yuan, Jing-dong	Monterey Institute of International Studies	July 12–13, 2007

APPENDIX IV-B
Interlocutors' Organizations—
2007 Asia Fact Finding Trips

CHINA AND HONG KONG, APRIL–MAY 2007

During the visit of a U.S.-China Commission delegation to China and Hong Kong in April-May 2007, the delegation met with representatives of the following organizations:

In Beijing

- U.S. Embassy Beijing
- Chinese People's Institute of Foreign Affairs
- Ministry of Commerce of the People's Republic of China
- State Office of Intellectual Property Protection of the People's Republic of China
- China Institute of International Studies
- Academy of Military Sciences of the People's Liberation Army

In Dalian

- Dalian Port Group
- Dalian Free Trade Zone Administration
- Goodyear Dalian
- Dalian Commodity Exchange
- Dalian Software Park
- HSBC (bank/financial services firm)
- Bank of East Asia

In Anshan

- Anshan Iron and Steel Group

In Shenyang

- U.S. Consulate Shenyang
- Brilliance Auto Group
- PetroChina Fushun Petrochemical Company
- Shenyang GE Liming Gas Turbine Components Co., Ltd.
- GE Energy (Shenyang) Company Ltd.
- GE Shenyang Turbomachinery Technology Co., Ltd.

In Hong Kong

- U.S. Consulate Hong Kong
- Legislative Council
- American Chamber of Commerce

- Civic Exchange
- The Conservancy Association
- Hong Kong University
- Government of the Hong Kong Special Administrative Region, People's Republic of China
- Hong Kong Productivity Council
- China Labour Bulletin
- International Republican Institute
- Project Civil Referendum
- Civic Party
- Democratic Party
- Democratic Alliance for the Betterment and Progress of Hong Kong
- Frontier Party

TAIWAN AND INDIA, AUGUST 2007

During the visit of a U.S.-China Commission delegation to Taiwan and India in August 2007, the delegation met with representatives of the following organizations:

In Taipei

- American Institute in Taiwan/Taipei
- Ministry of Economic Affairs
- Board of Foreign Trade, Ministry of Economic Affairs
- Investment Commission, Ministry of Economic Affairs
- Taiwan Semiconductor Manufacturing Company
- Winbond Electronics Corp.
- Far Eastern Group
- China Network System Co.
- Mitac Inc.
- Industrial Technology Research Institute
- Etron Technology Inc.
- Taiwan High Speed Rail Corporation
- National Security Council
- Mainland Affairs Council
- Ministry of Foreign Affairs
- Executive Yuan
- American Chamber of Commerce, Taipei
- Visa International
- Raytheon International Inc.
- Electronic Data Systems Taiwan Corp.
- Corning Display Technologies Taiwan
- ABB Ltd.
- Taiwan Armed Forces
- Ministry of Defense
- Kuomintang Party
- Democratic Progressive Party

In Kaohsiung

- Kaohsiung Harbor Bureau
- American Institute in Taiwan/Kaohsiung

In New Delhi:

- U.S. Embassy New Delhi
- Center for Policy Research
- University of Delhi
- Center for Air Power Studies
- Hard News/Hard News Media Pvt. Ltd.
- Federation of Indian Chambers of Commerce and Industry
- Observer Research Foundation
- Representative of the Dalai Lama
- Jawaharlal Nehru University
- Institute for Peace and Conflict Studies
- Manipal Academy
- United Services Institute of India
- Former Indian Government, Diplomatic, and Armed Forces Officials

APPENDIX IV-C

Briefers at National Air and Space Intelligence Center and Air Force Research Laboratory, Wright-Patterson Air Force Base June 28-29, 2007, Dayton, Ohio

Office of the Director, Defense Research and Engineering (DDR&E), U.S. Department of Defense

- Dr. William Rees, Deputy Under Secretary of Defense (Laboratories and Basic Sciences)

Defense Advanced Research Projects Agency (DARPA)

- Dr. Bob Leheny, Deputy Director

Navy

- Dr. Patricia Gruber, Director of Research, Office of Naval Research (ONR)

Army

- Dr. John Parmentola, Director for Research and Laboratory Management, Department of the Army

Air Force

- Dr. Brendan Godfrey, Director, Air Force Office of Scientific Research (AFOSR)

National Air and Space Intelligence Center (NASIC)

- Mr. Gary O'Connell, Chief Scientist
- Ms. Karen Cleary

National Ground Intelligence Center (NGIC)

- Mr. Steve Pellisier
- Mr. William Shin
- Ms. Debra Hodnik

Armed Forces Medical Intelligence Center (AFMIC)

- Mr. Don Wyma

Missile and Space Intelligence Center (MSIC)

- Dr. Elliot Lehman
- Mr. Mike Danis

**Weapons Intelligence Non Proliferation and Arms Control
Center (WINPAC)**

- Mr. Alex Cash
- Mr. Chuck Golanoski

APPENDIX V LIST OF RESEARCH MATERIAL

The material listed below is available online at the Commission's web site www.uscc.gov. The research papers were prepared at the request of the Commission to support its deliberations and are intended to promote greater public understanding of the issues addressed by the Commission. However, inclusion in the Report does not imply an endorsement by the Commission or any individual Commissioner of views expressed in the material.

Commissioned Research Papers

- Charles W. McMillion, Ph.D, *Field Investigation: Effects of United States-China Trade on the Economy of the State of North Carolina* (Prepared for the U.S.-China Economic and Security Review Commission, September 6, 2007). Available online at www.uscc.gov/researchpapers/2007/Commissioned%20Briefing%20Paper.pdf.
- Michael P. Pillsbury, Ph.D, *An Assessment of China's Anti-Satellite and Space Warfare Programs, Policies and Doctrines* (Prepared for the U.S.-China Economic and Security Review Commission, January 19, 2007). Available online at www.uscc.gov/researchpapers/2007/FINAL_REPORT_1-19-2007_REVISD_BY_MPP.pdf.

APPENDIX VI ABBREVIATIONS

APP	Asia Pacific Partnership for Clean Development and Climate
AFL–CIO	American Federation of Labor and Congress of Industry Organizations
AFRL	U.S. Air Force Research Laboratory
AOARD	Asian Office of Aerospace Research and Development [U.S. Air Force]
ASAT	anti-satellite
BWC	Biological Weapons Convention
C2	command and control
C4	command, control, communications, and computers
C4ISR	command, control, communications, computers, intelligence, surveillance, and reconnaissance
CCP	Chinese Communist Party
CCS	carbon capture and sequestration
CETGC	China Electronic Technology Group Corporation
CIC	China Investment Corporation
CNOOC	Chinese National Offshore Oil Corporation
CNPC	China National Petroleum Corporation
COSTIND	Commission of Science, Technology, and Industry for National Defense
COTS	commercial off-the-shelf
CSI	Container Security Initiative
CTBT	Comprehensive Test Ban Treaty
CVD	countervailing duties
CWC	Chemical Weapons Convention
DAB	Democratic Alliance for the Betterment and Progress of Hong Kong
DARPA	Defense Advanced Research Projects Agency
DPRK	Democratic People’s Republic of Korea
EETC	Energy and Environmental Technology Center [at Tulane University]
EPA	[U.S.] Environmental Protection Agency
EPD	[U.S.-China] Energy Policy Dialogue
EXBS	[U.S. State Department] Export Control and Related Border Security Program
FIE	foreign invested enterprises
Forex	foreign exchange
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GIC	Government of Singapore Investment Corporation
GNEP	Global Nuclear Energy Partnership

GPS	Global Positioning System
HKSAR	Hong Kong Special Administrative Region
IAEA	International Atomic Energy Agency
IAM	International Association of Machinists and Aerospace Workers
IEA	International Energy Agency
IES	Integrated Environmental Strategies Program
IGCC	Integrated Gasification Combined Cycle
IMF	International Monetary Fund
IP	intellectual property
IPO	initial public offering
IPR	intellectual property rights
IRBM	intermediate-range ballistic missile
ISR	intelligence, surveillance, reconnaissance
IT	information technology
JCCT	[U.S.-China] Joint Commission on Commerce and Trade
MaRV	maneuverable reentry vehicle
MIT	Massachusetts Institute of Technology
MOST	Ministry of Science and Technology
MRBM	medium-range ballistic missile
MTCR	Missile Technology Control Regime
NDRC	National Development and Reform Commission
NDF	Nonproliferation and Disarmament Fund
NGO	nongovernmental organization
NOC	national oil company
NORINCO	China North Industries Corporation
NPT	Nuclear Nonproliferation Treaty
NSG	Nuclear Suppliers Group
ONR	Office of Naval Research [U.S. Navy]
P2E2	Pollution Prevention and Energy Efficiency Program
PFPC	PetroChina Fushun Petrochemical Company
PLA	People's Liberation Army
PLAAF	PLA Air Force
PLAN	PLA Navy
PPP	purchasing power parity
PRC	People's Republic of China
PSI	Proliferation Security Initiative
PUNT	[U.S.-China] Peaceful Uses of Nuclear Technology Agreement
QDR	Quadrennial Defense Review
R&D	research and development
RADM	Rear Admiral
RFA	Radio Free Asia
RTP	Research Triangle Park
S&T	science and technology
SCO	Shanghai Cooperation Organization
SAFE	State Administration for Foreign Exchange
SASAC	State-Owned Assets Supervision and Administration Commission
SED	Strategic Economic Dialogue
SEO	State Energy Office

SEPA	State Environmental Protection Administration [China]
SINOPEC	China Petroleum and Chemical Corporation
SIPO	State Intellectual Property Office [China]
SIPRI	Stockholm International Peace Research Institute
SLOC	sea lines of communication
SME	small- and medium-sized enterprises
SOE	state-owned enterprise
SPR	Strategic Petroleum Reserve
SWF	sovereign wealth fund
UAV	unmanned aerial vehicle
U.N.	United Nations
UNAMID	U.N.-African Union Hybrid Peacekeeping Operation in Darfur
USTR	United States Trade Representative
USSTRATCOM	United States Strategic Command
VAT	value added tax
VOA	Voice of America
WIPO	World Intellectual Property Organization
WMD	weapons of mass destruction
WME	weapons of mass effect
WTO	World Trade Organization

APPENDIX VII-A

Government of China Industry Subsidies (Applicable to Textile Industry)

Subsidy	Relevance	Description	Financial
1 (Title Unknown)	Specific	Benefits under the 2006 Notice of Relevant Policies to Promote Chinese Textile Enterprises to Shift to New Ways of Growth and Support Them to Go Global. This also allows for funding for textile companies that set up distribution channels in overseas markets. -- -- WTO consistency questioned	
2 Brand Building Incentives (Shishi City of Fujian Province)	Applicable	Under the city's most recent award measures, textiles and apparel companies with well-known brand names recognized by the State Administration of Industry and Commerce or the Administration of Quality Supervision, Inspection and Quarantine can receive a lump-sum award of RMB 500,000 for companies with well-known export brand names, the award is RMB 400,000. In addition, companies that have received quality inspection waivers from the national government are eligible for awards of RMB 100,000 from the Shishi City government.	Award amounts range from RMB 100,000-500,000
3 Brand Development Fund	Applicable	The fund should serve the following purposes: To support companies in implementation of brand development programs, to support companies in participation of national and international exhibitions, to support brand promotion activities, To support international exchanges, trainings and seminars related to brand building, and to support other public services that facilitate brand building.	The Ministry of Commerce and the Ministry of Finance appropriate the fund to provincial governments who are required to formulate their own measures on the administration of the fund. (Note: With respect to the amount of the grants, for corporate development projects, each project can receive a grant up to RMB 200,000 or 50 percent of the actual expenses required by the project; public services projects, if covered under the public services project plan jointly determined by the provincial foreign trade bureau and finance bureau, can be fully subsidized)
5 Export Awards (Local export-related awards)	Applicable	Certain local export-related awards.	Information available to the U.S. indicates that various Chinese government entities at the sub-central level provide awards and direct payments for export-related programs. These also regional programs that tie monetary awards solely to the amount exported or to a percentage growth above the previous year's export totals --WTO consistency is questioned.
6 Export Incentive Program (Ningbo City's Jiangdong District Export Contingent Award for Increasing Exports of Textiles and Apparel Goods)	Specific	A program in Ningbo City's Jiangdong District offers benefits to certain textile and apparel companies. Example: Textile and apparel companies that export more than USD \$1 million per year in this district are eligible for an award for each dollar of textiles and apparel exports which exceed the previous year's total. -- WTO consistency is questioned	
7 Export Incentive Program	Applicable	Export Interest Subsidy Funds for Enterprises Located in Zhejiang and Guangdong Provinces.	Export Interest Subsidy of \$0.03 for every \$1 of general merchandise procured in Shenzhen exported Guangdong provides a \$1250 subsidy for enterprises with more than \$1 million in exports.
8 Export Incentive Program (contingent support)	Applicable	Export Contingent Support for Famous Name Brand Products in order to increase Chinese name brand exports and limit its reliance on foreign name brand exports, the Chinese Government is offering the following incentives: An Export Brands Development Fund to develop and promote designated exports, Preferential funding for research and development products; Support for technology to strengthen the competitiveness of famous export products; Encouraging enterprises to establish R&D centers; Streamlined loan application procedures and easy access to export credit insurance. Similar or implementing programs offered at the central or sub-central government levels.	

Subsidy	Relevance	Description	Financial
9 Export Incentive Program (Credits)	Applicable	As reported by MOFCOM, Dalian Branch of the Export-Import Bank would provide RMB 5 billion of export credits to companies to enter global markets, and, since November 2003, "low-cost credit provided by the bank has saved the enterprises RMB 150 million interest."	RMB 5 billion of export credits
10 Export Incentive Program (Credits)	Applicable	Export credits offered by China Development Bank to support sectors considered to be essential to China's long-term competitiveness and specifically for companies engaging in R&D, Chinese brand name companies, and certain companies in overseas expansion. --- WTO consistency is questioned.	
11 Export Incentive Program (Export-oriented enterprises preferential policies)	Applicable	Reported from the website of Shanghai Foreign Investment Center, export-oriented enterprises enjoy various preferential policies in the use of land, water, electricity, transportation, telecommunication, short-term funds and necessary loans, as well as local income tax exemption after expiration of normal income tax exemption if more than 70% of the production is exported. --- WTO consistency is questioned.	
12 Export Incentive Program (Government Assistance to increase fabric exports)	Specific	Measures under the program of upgrading the textile industry through accelerating technical reforms and strategic restructuring of textile enterprises, including substituting imported fabrics or expanding fabric exports.---WTO consistency is questioned	
13 Export Incentive Program (Guangdong Grants)	Applicable	Guangdong Grants provided for export performance.	The Guangdong provincial government has introduced a program of preferential grants over five years to enterprises meeting specific export targets. --- WTO consistency is questioned.
14 Export Incentive Program (Hangzhou City of Zhejiang Province)	Specific	Benefits are extended to exporters on the basis of the total amount of exports.	Award amounts range from RMB 10,000-10,000
15 Export Incentive Program (Interest Subsidy)	Applicable	As reported by www.tdctrade.com, the Export Interest Subsidy for Shenzhen Enterprises has been raised from 20% to 40%.	The policy of subsidizing USD \$0.03 for every USD \$1 export of general merchandise is only applicable to enterprises procured from Shenzhen. SMEs are not eligible to apply. Fund allocation is on a first-come-first-serve basis. The fund would provide RMB 800 million in 2004. --- WTO consistency is questioned.
16 Export Incentive Program (Ningbo City of Zhejiang Province)	Specific	Ningbo City of Zhejiang Province has been subsidizing certain textiles and apparel exporters since 1999. Under the Measures on Awarding Brand Name Textile and Apparel Exports issued in 1999, exporters of textile and apparel products with trademarks registered overseas and annual exports of over USD \$200,000 can receive monetary awards for the increment in exports over the previous year, to the tune of specific, an award of RMB 0.03 for every U.S. dollar of textile exports and an award of RMB 0.09 for every U.S. dollar of apparel exports.	An award of RMB 0.03 for every U.S. dollar of textile exports and an award of RMB 0.09 for every U.S. dollar of apparel exports.
17 Export Incentive Program (Subsidy Fund)	Applicable	As reported from Zhejiang Province, an Export Subsidy Fund based on a federal program.	Enables regional authorities to provide all exporting companies exporting more than USD \$3 million with a subsidy of 0.01 RMB per each USD \$ exceeding this threshold. --- WTO consistency is questioned.
18 Foreign Investment (Free Land)	Applicable	Free Land Given as Part of Foreign Investment Projects.	Guangdong government grants foreign investors, which meet certain investment conditions, land valued at twice the amount of an investor's original investment.
19 Foreign Trade Activities (Special) Funds	Applicable	Reported by www.tdctrade.com, the Guangdong provincial government supports private enterprises to "expand outward", and eligible private enterprises may apply for special funds conceived for developing foreign trade activities. These funds include market exploration, export credit insurance, offshore processing trade project loan interest subsidy, export research and development fund, antidumping proceedings fund, export credit insurance, and outward-looking enterprises development fund. --- WTO consistency is questioned.	
20 Foreign Trade Development Fund (Central Foreign Trade Development)	Applicable	The Central Foreign Trade Development Fund, the alleged purpose of the Fund is to regulate and promote foreign trade; to encourage the development and export of new electronic, deep-processing, high-tech and high value-added products; and to increase Chinese export capacity and competitiveness.	

Subsidy	Relevance	Description	Financial
21 Go Global (One of special funds for brand development)	Specific	Special fund (support program of central government) to support restructuring of textile industry and the efforts of Chinese textile companies to "go global".	The initial scale of the fund is RMB 1.35 billion with RMB 500 million dedicated to projects related to technology innovation and restructuring and RMB 800 million for the "go global" operation.
22 Hangzhou Municipal Government cooperation	Specific	In January 2006, the Chinese National Textile and Apparel Industry Council (CNTAC) and the Hangzhou Municipal Government signed a cooperation agreement under which CNTAC will give priority support to the upgrading of technology, a support platform in China. After the completion of the project, the central government will establish a textile innovation service platform with a total investment of RMB 320 million in the Xiaoshan district of Hangzhou City, the largest polyester manufacturing base in the world.	
23 Import licensing exemption	Applicable	Import licensing exemption on products imported by FIEs to produce goods for export.	
24 Income Tax Program (Benefits under new Enterprise Income Tax Law)	Applicable	Benefits under new Enterprise Income Tax Law	The government may extend tax benefits to companies engaged in industries the development of which is supported and encouraged by the State. --WTO consistency questioned If the existing tax benefits may be granted a grace period of up to 5 years. --consistency questioned
25 Income Tax Program (Exemption and Reduction)	Applicable	Local income tax exemption and reduction program for "productive" FIEs. Pursuant to Chinese tax regulations, local provinces authorize their own tax exemptions to specific industries, i.e. productive FIEs, within their jurisdiction.	
26 Income Tax Program (Exemption)	Applicable	Income tax exemption on profits made by certain FIEs.	Profits distributed to foreign investors by foreign-invested enterprises that export more than 50% of their products, or that utilize foreign advanced technology to produce products for export, are exempt from income tax at only half the normal rate.
27 Income Tax Program (Exemption)	Applicable	Income Tax Exemptions Program for FIEs located in certain geographic locations. Following the conclusion of the "two free, three half" program, FIEs located in specific designated locations can continue to pay income tax at only half the normal rate.	
28 Income Tax Program (Rate)	Applicable	Under China's newly-enacted Enterprise Income Tax Law which equalizes the income tax rate for domestic and foreign enterprises at 25 percent, state-encouraged new- and high-technology enterprises can enjoy a favorable 15 percent income tax rate. (In an effort to encourage domestic and foreign companies to invest in the manufacturing of advanced textile machinery.)	
29 Income Tax Program (Reduction)	Applicable	Income tax reduction available to foreign-invested companies for the purchase of Chinese-produced equipment.	Foreign-invested companies can deduct 40% of the cost of purchasing domestically-produced equipment that is win the total investment of the project, or beyond the total investment of the project, from the total investment of the project. The amount of the increase in income tax in the year the equipment is purchased compared to previous year. --WTO consistency is questioned
30 Income Tax Program (Reduction)	Applicable	Income tax reduction available to Chinese companies for the purchase of Chinese-produced equipment.	For technology renovation projects consistent with the national industrial policies, 40% of the cost to purchase domestically-produced equipment required in the projects can be deducted from the increment in income tax in the year the equipment is purchased compared to the previous year. --WTO consistency is questioned
31 Income Tax Program (Reduction)	Applicable	Income tax reduction available to foreign-invested companies that satisfy certain export performance requirements.	After the completion of the normal reduction or exemption of income tax for production oriented FIEs, foreign-invested exporting companies can pay income tax at one-half of the present rate, provided 70% of their products are exported. --

Subsidy	Relevance	Description	Financial
32 Income Tax Program (Reduction)	Applicable	Income tax reduction available to foreign-invested companies that satisfy certain export performance requirements.	Foreign-invested companies engaged in industries allowed by the State that export all of their products may pay a reduced income tax of 15% --WTO consistency is questioned
33 Income Tax Program (Refund)	Applicable	Income tax refund available to foreign-invested companies that reinvest profits in certain qualified projects in China.	Foreign investors who reinvest their profits to establish or expand exporting companies or technologies-advanced companies for a period of operation of not less than five years shall be refunded the total amount of income tax already paid in reinvested portion. --WTO consistency is questioned
34 Income Tax Program (Refund)	Applicable	Corporate Income Tax Refund Program for reinvestment of FIE profits in export-oriented enterprises. Per the Chinese Ministry of Finance's authorization, that FIEs, or foreign investors in Chinese companies that re-invest profits into the same FIE or use the profits to establish another FIE are eligible for complete refund of the corporate income tax already paid on the invested amount, so long as the recipient is export oriented and scheduled to operate for five years.	Complete refund of corporate income tax already paid on the invested amount.
35 Land Grant Program	Applicable	Provision of Land for Less than Adequate Remuneration (GOC Grant Programs). The GOC provides incentives to SOEs in the high-tech industry. Additionally, provincial governments provide subsidies through lease arrangements on land to targeted industrial sectors (including textiles).	
36 Legal Fees Reimbursements	Applicable	Reported by www.ictrade.com and China Daily, the Shenzhen WTO affairs office sponsors a fund of more than 10 million in order to reimburse up to 30% of legal fees incurred by local export companies facing antidumping lawsuits. -- WTO consistency is questioned.	A fund of more than 10 million
37 Lending Program	Specific	Excessive lending to the textile industry noted by the secretary-general of the China Cotton Association and that the Chinese Government will loosen up credit lending controls to textile companies as reported on a 2004 China Daily article.	
38 Loan Interest Subsidy (Environmental)	Applicable	Loan Forgiveness for (LWS/Textile) Producers by the GOC. The GOC allowed textile companies to file bankruptcy and allowed to write off debt. The GOC has also created a reserve fund to accommodate this debt.	Complete refund of corporate income tax already paid on the invested amount.
39 Loan Programs	Applicable	Incentives provided to investors include tax benefits, preferential treatment in land use, preferential treatment in administrative fees.	
40 Local Textile Industrial Parks	Specific	Information available to the US indicates that the Ningbo City INT Trade and Economic Cooperation Bureau provides benefits to the city's top eight textiles and apparel brand enterprises which export more than USD \$20 million.	The top eight brand companies which meet the qualifications receive and award of RMB 50,000.
41 Model enterprises allowance	Applicable	Continued use of state-owned banks to keep non-viable SOEs afloat.	Writing off non-performing loans of SOEs as part of the Northeast revitalization program, one example is that Ningbo City provides incentives to write off non-performing loans of SOEs. -- WTO consistency is questioned.
42 Ningbo Export Contingent Aid for Textile Exporters - "Export Branding"	Specific	Discounted Loan Program. Discounted loans, interest subsidies, and debt forgiveness are provided through policy banks and state-owned banks providing policy loans.	According to a document posted by the Jiangsu Province Tax Bureau in September 2004 entitled "Tax Reimbursement Regime on Exported Goods in China," exported goods that are "manufactured by using preferential loans of the Chinese government" will be "given approval to reimburse or exempt VAT or consumption tax due to some special features such as
43 Northeast revitalization program (portion of)	Applicable	Preferential loans provided by the Chinese government.	Manufactured and sold in Jiangsu Province, etc.
44 Policy Loans	Applicable	Reported subsidies in the textile industry in connection with manufacturing or raw materials, the financing mill establishments, and the purchase and selling of raw materials, e.g., certain tax incentives and preferential rents provided to textile companies located in Changzhou City of Jiangsu Province.	
45 Preferential Loans	Applicable		
46 Subsidies (incentives)	Specific		

Subsidy	Relevance	Description	Financial
63 Technology Incentive Program (Assumption of Interest on Loans for Technology Innovation)	Specific	Government payment of interest on bank loans for the technology upgrades of state-owned enterprises, including textile enterprises.	
64 Technology Innovation Grants	Applicable	Technological Innovation Funds Provided by Zhejiang Province.	The program provides payments ranging from \$3,750 to \$8,250 (if the product is consistent with national/provincial economic plans)
65 Technology Innovation-Loan Interest Subsidies	Applicable	Local governments are providing loan interest subsidies to support technological innovation projects. Zhongshan City, for example, has provided loan interest subsidies that cover 30-40 percent of the actual interest payments on loans.	
66 Ten Thousand Miles March for Brand Building	Applicable	The government has launched a campaign under which companies whose brand names are certified as "famous" will be given free media publicity. Public funds are awarded to cover part of the brand-building expenditures. Local government assistance for brand name building is also available to textiles and apparel companies. (Ningbo City, home to several leading textile manufacturers, has been providing awards to companies that export textiles and apparel products on a regular basis.)	Free media publicity Funds given to cover brand building expenditures
67 The "Two Free, Three Half" Program	Applicable	Under Chinese law, FIEs' "productive" and "is scheduled to operate for not less than ten years may be exempted from income tax in the first two years of profitability and pay income taxes at half the standard rate for the next three years.	Applicable companies are exempted from income tax in the first two years of profitability and pay income taxes at half the standard rate for the next three years.
68 Trade Promotion Fund	Specific	The Trade Promotion Fund for Agriculture, Light Industry and Textile Products. Textile companies that have conducted R&D projects or have been contracted for state or provincial research projects in the past three years, as well as textile industry associations with a membership of not less than 500 that have hosted national or international exhibitions, seminars and trainings in the past three years, are both eligible to receive grants from the fund.	Each project related to the technology service platforms can be subsidized with a grant up to RMB 2 million.
69 Value Added Tax (Refund)	Applicable	Full VAT refund available to foreign-invested companies for the purchase of Chinese-produced equipment.—WTO consistency is questioned.	
70 Value Added Tax (Special Refund)	Specific	A special VAT refund scheme for silk to be exported.	
71 VAT and tariff exemption	Applicable	VAT and tariff exemption available to foreign-invested companies that satisfy certain export performance requirements.	For foreign-invested companies engaged in industries allowed by the State that export all of their products, equipment purchased for self-use, shall be exempt from tariff and import VAT.—WTO consistency is questioned
72 VAT expenses (exemption)	Applicable	VAT expenses exemption and deduction.	Based on the EC's experience in anti-dumping cases, it claims that the exemption of VAT on the purchase of equipment by suppliers did not charge and pay VAT.—WTO consistency is questioned.
73 Worker Benefit Contributions (Exemptions from mandatory worker benefit contributions)	Applicable	Exemptions from mandatory worker benefit contributions available to foreign-invested companies that satisfy certain export performance requirements.	Foreign-invested "product-export enterprises" and technologically advanced enterprises shall be exempt from payment to the State of all subsidies to staff and workers, except for the payment or allocation of funds for labor insurance, welfare expense, and housing subsidies.

APPENDIX VII-B
LIST OF SANCTIONS IMPOSED ON CHINESE
ENTITIES FROM JUNE 2004 TO NOVEMBER
2006

Date	Entity/Person	Controlling Statute
September 2004	Beijing Institute of Aerodynamics Beijing Institute of Opto- Electronic Technology (BIOET) China Great Wall Industry Cor- poration (CGWIC) North China Industries Corpora- tion (NORINCO) LIMMT Economic and Trade Com- pany Ltd. Oriental Scientific Instruments Corporation South Industries Science and Technology Trading Co.	Iran Nonproliferation Act: regarding missile and chemical weapons pro- liferation.
September 2004	Xinshidai	Executive Order 12938: regarding the prolifera- tion of weapons of mass destruction.
November 2004	Liaoning Jiayi Metals and Min- erals Company, Ltd. Q.C. Chen (Chen Qinqchang) Wha Cheong Tai Company Ltd. Shanghai Triple International Ltd.	Iran Nonproliferation Act: regarding missile and chemical weapons pro- liferation.
December 2004	Beijing Alite Technologies Com- pany Ltd. China Aero-Technology Import/Ex- port Corporation (CATIC) China Great Wall Industry Cor- poration (CGWIC) North China Industries Corpora- tion (NORINCO) Q.C. Chen Wha Cheong Tai Company, Ltd. Zibo Chemet Equipment Co. Ltd.	Iran Nonproliferation Act: regarding missile and chemical weapons pro- liferation.
December 2005	China Aero-Technology Import/ Export Corp. (CATIC) North China Industries Corpora- tion (NORINCO) LIMMT Metallurgy and Minerals Company Ltd. Ouinion (Asia) International Eco- nomic and Technical Coopera- tion Ltd. Zibo Chemet Equipment Company	Iran Nonproliferation Act: regarding missile and chemical weapons pro- liferation.

Date	Entity/Person	Controlling Statute
June 2006	Beijing Alite Technologies Company Ltd. (ALCO) LIMMT Economic and Trade Company Ltd. China Great Wall Industry Corporation (CGWIC) China Precision Machinery Import-Export Corp. (CPMIEC) G.W. Aerospace (a U.S. office of CGWIC)	Executive Order 13382: regarding missile proliferation.
August 2006	Great Wall Airlines Company Ltd.	Executive Order 13382: regarding missile proliferation and dual-use components.

APPENDIX VII-C
CHINESE STATE-OWNED ENTERPRISES
CONTROLLED BY STATE-OWNED ASSETS
SUPERVISION AND ADMINISTRATION
COMMISSION (SASAC)

Corporation (Chinese)	Corporation (English)	Fortune Global 500
中国核工业集团公司	China National Nuclear Corp.	
中国核工业建设集团公司	China Nuclear Engineering & Construction (Group) Corp.	
中国航天科技集团公司	China Aerospace Science and Technology Corp.	
中国航天科工集团公司	China Aerospace Science Industry Corp.	
中国航空工业第一集团公司	China Aviation Industry Corp. I	
中国航空工业第二集团公司	China Aviation Industry Corp. II	
中国船舶工业集团公司	China State Shipbuilding Corp.	
中国船舶重工集团公司	China Shipbuilding Industrial Corp.	
中国兵器工业集团公司	China North Industries Group Corp.	
中国兵器装备集团公司	China South Industries Group Corp.	
中国电子科技集团公司	China Electronics Technology Corp.	
中国石油天然气集团公司	China National Petroleum Corp.	✓
中国石油化工集团公司	China Petrochemical Corp.	
中国海洋石油总公司	China National Offshore Oil Corp.	✓
国家电网公司	State Grid Corp.	✓
中国南方电网有限责任公司	China Southern Power Grid Co. Ltd.	✓
中国华能集团公司	China Huaneng Group	
中国大唐集团公司	China Datang Corp.	
中国华电集团公司	China Huadian Corp.	
中国国电集团公司	China National Electricity Corp.	
中国电力投资集团公司	China Power Investment Corp.	
中国长江三峡工程开发总公司	China Yangtze Three Gorges Project	
神华集团有限责任公司	Shenhua Group Corp.	
中国电信集团公司	China Telecommunications Company	✓
中国网络通信集团公司	China Netcom Group Corp.	

Corporation (Chinese)	Corporation (English)	Fortune Global 500
中国联通通信有限公司	China Unicom Limited	
中国移动通信集团公司	China Mobile Communication Corp.	✓
中国电子信息产业集团公司	China Electronics Corp.	
中国第一汽车集团公司	China FAW Group Corp.	✓
东风汽车公司	Dongfeng Motor Corp.	
中国第一重型机械集团公司	China First Heavy Industries Corp.	
中国第二重型机械集团公司	China National Erzhong Group Corp.	
哈尔滨电站设备集团公司	Harbin Power Station Equipment Company	
中国东方电气集团公司	Dongfang Electric Corp.	
鞍山钢铁集团公司	Anshan Iron and Steel Group Corp.	
宝钢集团有限公司	Baosteel Group Ltd.	✓
武汉钢铁(集团)公司	Wuhan Iron and Steel (Group) Corp.	
中国铝业公司	China Aluminum Industry Company (aka:Chinalco)	
中国远洋运输(集团)总公司	China Ocean Shipping (Group) Company	✓
中国海运(集团)总公司	China Shipping (Group) Company	
中国航空集团公司	China National Aviation Holding Company	
中国东方航空集团公司	China Eastern Airlines Holding Company	
中国南方航空集团公司	China Southern Airlines Holding Company	
中国中化集团公司	China Sinochem Corp.	✓
中粮集团有限公司	COFCO Limited	✓
中国五矿集团公司	China Minmetals Corp.	✓
中国通用技术(集团)控股有限责任公司	China General Technology (Group) Holdings Limited	
中国建筑工程总公司	China State Construction Engineering Corp.	✓
中国储备粮管理总公司	China Grain Reserve Corp.	
国家开发投资公司	The State Development and Investment Corp.	
招商局集团有限公司	China Merchants Holdings Ltd.	
华润(集团)有限公司	China Resources (Holdings) Company Ltd.	
中国港中旅集团公司[香港中旅(集团)有限公司]	China Travel Service (Holdings) Hong Kong Ltd.	
国家核电技术有限公司	National Nuclear Technology Ltd.	
中国节能投资公司	China Energy Conservation Investment Corp.	
中国高新投资集团公司	China Gaoxin Investment Corp.	
中国国际工程咨询公司	China International Engineering Consulting Corp.	
中国包装总公司	China National Packaging Corp.	
中商企业集团公司	Zhongnan Commercial (Group) Corp.	
中国华孚贸易发展集团公司	China Huafu Trade & Development Group Corp.	
中国诚通控股公司	China Chengtong Group	

Corporation (Chinese)	Corporation (English)	Fortune Global 500
中国华星集团公司	China and China Star Group	
中国中煤能源集团公司	China Coal	
煤炭科学研究总院	Coal Science Research Institute	
中国汽车工业总公司	China National Automotive Industry International Corp.	
中国机械工业集团公司	China National Machinery Industry Corp.	
机械科学研究总院	China Academy of Machinery Science and Technology	
中国农业机械化科学研究院	China Academy of Agricultural Mechanization Sciences	
中国中钢集团公司	Sinosteel Corp.	
中国冶金科工集团公司	China Metallurgical Group Corp.	
中国钢研科技集团公司	China Iron & Steel Research Institute Group	
中国化工集团公司	China's Sinopec Corp.	✓
中国化学工程集团公司	China National Chemical Engineering Group Corp.	
中国轻工集团公司	China National Light Industry (Group) Corp.	
中国轻工业对外经济技术合作公司	China Light Industrial Corp. for Foreign Economic and Technical Cooperation	
中国工艺(集团)公司	China National Arts & Crafts (Group) Corp.	
中国盐业总公司	China National Salt Industry Corp.	
华诚投资管理有限公司	Hwa-sung Investment Management Ltd.	
中国恒天集团公司	China Hengtian Group Corp.	
中国纺织科学研究院	China Textile Academy	
中国中材集团公司	China National Materials Group Corp.	
中国建筑材料集团公司	China National Building Materials Group Corp.	
中国有色矿业集团有限公司	China Nonferrous Metal Mining (Group) Corp.	
北京有色金属研究总院	General Research Institute for Nonferrous Metals	
北京矿冶研究总院	Beijing General Research Institute of Mining & Metallurgy	
中国国际技术智力合作公司	China International Intellectech Corp.	
中国远东国际贸易总公司	China Far East International Trade Corp.	
中国国际企业合作公司	China International Enterprises Cooperative Corp.	
中国房地产开发集团公司	China National Real Estate Development Group Corp.	
中国建筑科学研究院	China Academy of Building Research	
中国北方机车车辆工业集团公司	China Northern Locomotive & Rolling Stock Industry (Group) Corp.	
中国南方机车车辆工业集团公司	China Southern Locomotive & Rolling Stock Industry (Group) Corp.	
中国铁路通信信号集团公司	China Railway Signal & Communications Corp.	
中国铁路工程总公司	China Railway Engineering Corp.	✓
中国铁道建筑总公司	China Railway Construction Corp.	✓

Corporation (Chinese)	Corporation (English)	Fortune Global 500
中国交通建设集团有限公司	China Communications Construction Company, Ltd.	
中国普天信息产业集团公司	China Putian Information Industry Group	
中国邮政器材集团公司	China National Postal and Telecommunications Appliances Corp.	
中国卫星通信集团公司	China Satellite Communications Corp.	
电信科学技术研究院	China Academy of Telecommunications Technology	
中国水利投资集团公司	China Water Investment Group Corp.	
中国农业发展集团总公司	China National Agricultural Development Group Corp.	
中国农垦 (集团) 总公司	China State Farms Agribusiness (Group) Corp.	
中国中纺集团公司	China National Textiles Import and Export Corp.	
中国对外贸易运输 (集团) 总公司	China National Foreign Trade Transportation (Group) Company	
中国丝绸进出口总公司	China National Silk Import and Export Corp.	
中国轻工业品进出口总公司	China National Light Industries Products Import and Export Corp.	
中国成套设备进出口 (集团) 总公司	China National Complete Plant Import and Export (Group) Corp.	
中国出国人员服务总公司	China National Service Corp. for Chinese Personnel Working Abroad	
中国生物技术集团公司	China National Biotechnology Group	
中国唱片总公司	China Record Corp.	
中国林业集团公司	China International Forestry Corp.	
中国福马机械集团有限公司	China Foma (Group) Corp.	
中国医药集团总公司	China National Pharmaceutical Group Corp.	
中国国旅集团公司	CITS Group Corp.	
中国新兴 (集团) 总公司	China Xinxing (Group) Corp.	
中国保利集团公司	China Poly Group Corp.	
中国新时代控股 (集团) 公司	China New Era Holding (Group) Corp.	
珠海振戎公司	Zhuhai Zhen Rong Corp.	
中国海洋航空集团公司	China Ocean Aviation Group Corp.	
中国建筑 designs 研究院	China Architecture Design & Research Group	
中国电子工程设计院	China Electronics Engineering Design Institute	
中煤国际工程设计研究总院	Sinocoal International Engineering Design & Research Institute	
中国海诚国际工程投资总院	China Haisum International Engineering Investment Corp.	
中国冶金地质总局	China Exploration and Engineering Bureau	
中国煤炭地质总局	China's General Administration of Coal Geology	
新兴铸管集团有限公司	Xinxing Ductile Iron Pipes Group Corp.	
中国民航信息集团公司	China TravelSky Holding Company	
中国航空油料集团公司	China Aviation Oil Holding Company	

Corporation (Chinese)	Corporation (English)	Fortune Global 500
中国航空器材进出口集团公司	China Aviation Supplies Import and Export Group Corp.	
中国电力工程顾问集团公司	China Power Engineering Consulting (Group) Corp.	
中国水电工程顾问集团公司	China Hydropower Engineering Consulting Group	
中国水利水电建设集团公司	China Hydraulic and Hydroelectric Construction Group Corp.	
中国黄金集团公司	China National Gold Group Corp.	
中国储备棉管理总公司	China National Cotton Reserves Corp.	
中国印刷集团公司	China Printing Corp.	
攀枝花钢铁(集团)公司	Panzhuhua Iron & Steel (Group) Corp.	
鲁中冶金矿业集团公司	Luzhong Metallurgy & Mining Group Corp.	
长沙矿冶研究院	Changsha Research Institute of Mining and Metallurgical	
中国乐凯胶片集团公司	China Lucky Film Group Corp.	
中国广东核电集团有限公司	China Guangdong Nuclear Power Group	
中国长江航运(集团)总公司	China Changjiang National Shipping (Group) Corp.	
上海船舶运输科学研究所	Shanghai Ship and Shipping Research Institute	
中国华录集团有限公司	China Hualu Group Corp.	
上海贝尔阿尔卡特股份有限公司	Alcatel Shanghai Bell Co., Ltd.	
彩虹集团公司	Rainbow Group	
武汉邮电科学研究院	Wuhan Research Institute of Post and Telecommunications	
上海医药工业研究院	Shanghai Institute of Pharmaceutical Industry	
华侨城集团公司	Overseas Chinese Town Group	
南光(集团)有限公司	Nam Kwong (Group) Company	
西安电力机械制造公司	Xian Electric Manufacturing Corp.	
中国葛洲坝集团公司	China Gezhouba Group Corporation	
三九企业集团(深圳南方制药厂)	March 9 Enterprise Group (Shenzhen Nanfang Pharmaceutical Factory)	
中国铁通集团有限公司	China Railcom Group Ltd.	
中国铁路物资总公司	China Railway Materials Commercial Corp.	

SOURCE: China's State-owned Assets Supervision and Administration Commission (SASAC), <http://www.sasac.gov.cn/zyqy/qym/Default.htm>

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