

## SECTION 2: TACKLING THE CONSEQUENCES OF CHINA'S ENERGY CONSUMPTION

“The Commission shall investigate and report exclusively 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. ...”

### Introduction

As a result of energy consumption growth, a growing dependence on imported oil supplies, and increasing emissions of carbon dioxide and other air pollutants, the People's Republic of China (PRC) government is confronted with the critical task of establishing and executing energy and environment policies that will both secure the energy supplies China needs and mitigate the environmental consequences of its energy use. As it faces this challenge, China is developing a regulatory framework but needs better oversight and implementation of energy and environmental policy. The United States has recognized the importance of improving China's energy governance and is cooperating to this end with China to address China's institutional problems.

### Addressing China's Institutional Capacity

Despite the importance to China of its energy supply, and the environmental effects on China and other nations from consumption of that energy, China's governmental apparatus regulating these policy areas, and the actions taken within them, is weak and largely ineffective. This can be attributed to a lack of institutional capacity for formulating sound policy, a discomfort with free market principles that if adopted and enforced would help China achieve some of its objectives more easily, a lack of will, and a consequent lack of resource commitment to establish new policies and enforce existing policies that seek to lower energy demand, increase energy efficiency, and promote environmentally sound practices. The problems within China's policy-making structure occur at both the central government and local government levels. Central government problems primarily are obstacles to establishing sound national policies as a result of competing interests within ministries and organizations of the central government. Local problems most often are challenges in implementing policy, some of them caused by dif-

ferent interests that motivate local government decision making. Problems of both types are evident in China's energy and environmental policy institutions.

The most obvious explanation for the weakness of China's energy and environmental institutions, their policies, and the implementation of those policies appears to be the government's lack of commitment. The Commission observed that when both the central and local governments determined to implement and enforce the policies and plans for the 2008 Olympic Games in Beijing, those objectives most often were achieved. For example, China's government decided that it would improve the quality of Beijing's air during the Olympics and that auto use must be limited and the activities of polluting industries must be suspended (or the industrial operations temporarily or permanently moved from the Beijing area). These were drastic, far-reaching measures with profound economic implications and inconvenience for Beijing residents, but the government efficiently and effectively implemented them, and Beijing's air quality during the games improved substantially.

Nonetheless, China's leaders have recognized the impact that institutional problems have on the government's ability to carry out policy, and therefore have taken, and are to be commended for taking, some preliminary steps toward addressing these problems. At this time, it is too early to know conclusively the extent to which the central and local governments in China will support these steps and augment them as needed. It also is too early to know the extent to which they will succeed in the long term in improving China's energy efficiency and reducing its pollution.

### ***China's Energy Policy-making Structure***

China's capacity for formulating and enforcing energy policy has been constrained severely by the fragmented distribution of responsibilities among more than 12 different government departments and bureaus.<sup>102</sup> Beginning in 2003, the Energy Bureau of the National Development and Reform Commission (NDRC) was established to exercise primary responsibility for energy policy coordination. However, this control was diluted over time by the distribution of responsibilities across a wide spectrum of government bureaucracies and the involvement of the State Council National Energy Leading Group (created in 2005), the Ministry of Environmental Protection, the Ministry of Land and Resources, the Ministry of Water Resources, the State Administration of Coal Safety, and state-owned energy companies. This has produced overlapping jurisdictions and authorities and often conflicting interests. For example, the Ministry of Land and Resources governs resource extraction rights—thereby controlling coal mining—while the Ministry of Environmental Protection is charged with enforcing the environmental compliance of energy firms.

The State-owned Assets Supervision and Administration Commission, which controls all state-owned resources including energy assets, collects dividends from energy corporations and is responsible for appointing energy corporation executives, further dilutes regulatory control.<sup>103</sup> Offering one illustration of the conflicts that exist among this array of agencies and authorities that share energy and environment policy making, implementation, and regula-

tion, Edward Cunningham, a Ph.D. candidate at the Massachusetts Institute of Technology, testified to the Commission at its August 2008 public hearing that the State-owned Assets Supervision and Administration Commission and the National Development and Reform Commission have conflicting industrial policy priorities: The State-owned Assets Supervision and Administration Commission and the Ministry of Finance are seeking to consolidate energy firms and minimize their number, and the National Development and Reform Commission is seeking to encourage competition among energy firms, an objective that benefits from a large number of firms.<sup>104</sup>

As the Chinese leadership has struggled with creating a cohesive energy strategy, all these actors have worked to keep control of their respective pieces of energy policy.<sup>105</sup> Conflicts in the central government have been exacerbated by the involvement of China's state-owned energy companies. As a facet of China's economic liberalization, the PRC government created a group of corporations with the mission of meeting the country's energy needs. Mr. Cunningham explained, "The energy corporation initially served as a vehicle to resolve increasingly blurred rights and claims between central and local government control over energy assets, and also to attract foreign technology and financing to develop domestic resources under tight credit market conditions."<sup>106</sup> When those corporations were formed, the NDRC's energy bureaucracy lost much of its expertise to the companies as well as its influence in regulating energy production.

However, the relationship between the companies and government agencies does have some healthy aspects. The companies recognize the impact they have, and the importance of that impact, in providing energy security and thereby ensuring economic growth, and the government recognizes the technical skill and proficiency of the energy companies, many of which operate on the international market. While the energy companies operate largely beyond the day-to-day control of the central government, the government's top leaders are able to—and do—weigh in on major decisions, particularly on foreign energy investments.<sup>107</sup> Additionally, energy subsidies from the central government prop up companies that purchase supplies on the market but face price controls on their products.<sup>108</sup>

The PRC leadership has acknowledged the need for greater energy efficiency to slow demand growth. And the government recognizes that, in order to rein in demand, it must have a unified energy policy. To improve the government's ability to monitor and control China's growing energy consumption, the leadership has attempted to centralize energy policy making. In its most recent attempt, in March 2008 at the 11<sup>th</sup> National People's Congress, the State Council created two new energy policy-making organizations. The State Energy Commission replaces the National Energy Leading Group, which set policy priorities, and the National Energy Administration was created to manage the operations of the State Energy Commission.<sup>109</sup> The National Energy Administration (NEA) is a vice-ministerial organization under the authority of the NDRC. Currently, it has a staff complement of 112.<sup>110</sup> Beginning in July 2008, it is responsible for planning the activities of and governing

the oil, gas, coal, and power industries. In addition, it will play a role in proposing changes to energy prices and approving overseas energy investment projects.<sup>111</sup> This institutional change maintains state control and involvement in the energy industry and does not appear to be designed to allow or encourage market solutions to solve China's energy demand and supply challenges.

There is little hope that the restructuring will result in significant shifts in China's energy policy, primarily because the National Energy Administration falls short of being a full-fledged ministry with a ministry's array of powers, and instead functions in large part under the control of the National Development and Reform Commission.<sup>112</sup> Despite its involvement in determining energy policies, the NEA cannot make adjustments to energy prices without NDRC or State Council approval. Under this new structure, the NEA can suggest energy price adjustments, but the NDRC maintains authority over final decisions on energy pricing, a task that has grown increasingly controversial given the current state of global commodity prices.

Because it is unable to respond to changes in energy demand and supply by adjusting energy prices accordingly, the National Energy Administration lacks the authority it needs to administer China's energy policy effectively.<sup>113</sup> It is incapable of coordinating stakeholders in the government, and lacks autonomy, manpower, and tools. As Erica Downs of The Brookings Institution noted in her testimony, "The organizational changes [that resulted in the establishment of the National Energy Administration] are tantamount to rearranging deck chairs on the Titanic."<sup>114</sup>

Joanna Lewis, an assistant professor of science, technology, and international affairs at Georgetown University, testified that the difficulty in implementing central government energy policy results primarily from the lack of incentives at the local level to follow Beijing's directives.<sup>115</sup> Provincial and local government leaders are concerned principally with boosting economic output, and decreasing energy use or funding investment in clean energy technology will diminish the local government's returns, at least in the short term. For this reason, provincial or local leaders often attempt to boost local economic growth by secretly financing new energy projects or underreporting energy production to central authorities.<sup>116</sup> In addition, Beijing struggles to regulate the operations of smaller, private energy companies such as coal mines in the provinces. These mines are the worst violators of safety and environmental regulations, and they often are shielded from regulation or closure by corrupt local officials.<sup>117</sup>

China has considered further reforming its energy policy-making structure to resolve power struggles in the central government and to lend more weight to the implementation of central government policies at the local level. Some government officials are pushing for establishment of a full-fledged energy ministry. A draft energy law released in 2007 is intended to provide a framework for comprehensive institutional reform and consolidation of authority. However, because of resistance by government departments to the reforms already instituted, Chinese officials have stated that the earliest possible date for consideration of this new law will be 2009.<sup>118</sup> It appears that for the near future, China's energy policy

institutions will remain incapacitated and incapable of crafting meaningful reforms to resolve the energy production and pricing problems affecting the country's energy security and environment.

### ***China's Environmental Policy-making Structure***

At the 11<sup>th</sup> National People's Congress in March 2008, the State Council altered the status and name of the State Environmental Protection Agency (SEPA), which had been a vice-ministerial-level agency. It was given full ministry status and renamed the Ministry of Environmental Protection. China's environmental policy governance is concentrated in this one ministry. The Ministry of Environmental Protection is a relatively small ministry, with perhaps 2,600 personnel, only about 300 of whom are located in the Beijing headquarters.<sup>119</sup> This compares to the U.S. Environmental Protection Agency (EPA), which has 17,000 employees, nearly 9,000 of whom work in the Washington, DC, headquarters.<sup>120</sup>

The change from the State Environmental Protection Agency to the Ministry of Environmental Protection occurred simultaneously with the creation of the National Energy Administration, but the difference between these two reforms is that SEPA was raised to ministerial status, reflecting symbolically the higher priority now being placed on environmental protection. It is still too early to tell what impact this change will have on environmental policy making, but early assessments are pessimistic—primarily because the government has not provided the resources SEPA requires to accomplish its objectives. Scott Fulton, principal deputy assistant administrator of the U.S. EPA for International Affairs, observed that the EPA's Chinese counterparts still appear to have a limited mandate and an imperfect division of labor within the department,<sup>121</sup> thus hindering the formation of policy.

Additionally, Jonathan Schwartz, an assistant professor of science and international relations at the State University of New York at New Paltz, observed in his testimony that ministries in the central government have varying degrees of influence and power. The Ministry of Environmental Protection may take actions to limit industrial development or may impose costs on industrial pollution, which puts it at a disadvantage vis-à-vis other central government ministries and ministerial-level, state-owned enterprises that are pursuing the government's higher priority of maximizing revenue and profits. Existing incentives for promoting rapid economic growth cause other ministries to be less compliant in supporting the environmental regulation of industry. This is a fundamental dilemma in China's institutional structure and, so far, steps have not been taken to resolve it. Until this occurs, the new environmental ministry's ability fully to implement sound policy and regulate environmental pollution will be limited.<sup>122</sup>

Compounding this problem is the fact that China lacks a highly trained corps of environmental experts. As a result, even those in high-ranking positions often lack environmental policy expertise. In addition, many of these officials see their positions in the environmental policy bureaucracy as temporary stops along the way to more important (and often more lucrative) positions in other fields; as a result, they are reluctant to jeopardize relationships with in-

fluent figures in business and industry and, therefore, they rarely hold industry to rigorous environmental standards.<sup>123</sup>

The greatest impediment to more effective environmental regulation and protection is the weak implementation of central government policies at the local level, and this situation is unlikely to change as a result of elevating the State Environmental Protection Agency to a ministry. At each level of government, Environmental Protection Bureaus are charged with carrying out the directives of the Ministry of Environmental Protection. However, at the same time, these bureaus are beholden to their local governments, because they are dependent on local government funding as well as the fees and pollution fines they collect from local industries. Under the Environmental Protection Law, local Environmental Protection Bureaus can levy pollution taxes against firms for any air and water pollution they produce above legally acceptable levels. Local bureaus rely heavily for operational funding on the pollution fines they collect, as the funding available to the central government's Ministry of Environmental Protection to distribute to the local bureaus is very limited. However, this creates a "Catch 22" situation for local bureaus, as Dr. Schwartz noted: Aggressive enforcement of environmental policies could result in closure of polluting local factories and therefore reduce revenue available to those bureaus.<sup>124</sup>

Given that the Ministry of Environmental Protection has no control over the budgets of local environmental bureaus and therefore can have little influence over staffing, programs, and funding decisions, the disjuncture between the central government and local governments remains quite large. As a recent *Economist Intelligence Unit* report argues,

*[The Ministry of Environmental Protection] has a larger budget and greater bureaucratic clout than [the State Environmental Protection Agency] did. Unlike [the agency], [the ministry's] status as a full ministry allows it to bargain with provincial authorities on an equal footing. But authority related to environmental protection remains highly fragmented, split both among various central-government ministries, and between [the ministry] and local environmental protection bureaux . . . controlled by local governments. This dysfunctional power structure makes it hard to co-ordinate policies and often renders [the ministry's] work ineffective.*<sup>125</sup>

Also thwarting central government efforts to achieve significant pollution reduction is the lack of concern about pollution by many local governments and the higher priority many of them place on economic development. During the visit of a Commission delegation to Hong Kong in April 2008, environmental experts told Commissioners that if factory owners in Guangzhou were pressured to clean up their operations, the factories would simply relocate to another city in Guangdong Province. Local governments often are unwilling to support enforcement of environmental standards because they perceive such activity as potentially hindering economic growth and reducing tax revenue, employment, and local stability.<sup>126</sup>

The system of evaluation and promotion for local officials contributes to this lack of willingness. Since economic liberalization policies took effect, the performance of local officials has been judged on the basis of their ability to foster growth in the areas they oversee. Many officials perceive economic growth and environmental protection as a zero-sum game. Given that their political futures depend on their ability to generate growth, officials often have demonstrated their willingness to turn a blind eye to environmental transgressions by profitable local companies.<sup>127</sup> This may change in the near future, as the Organization Department of the Communist Party of China's (CCP) Central Committee<sup>128</sup> intends to use environmental protection as "an 'important index' in measuring local officials' performance" for potential positions within the party, according to an Open Source Center analysis.<sup>129</sup> Whether this actually results in improved environmental compliance will only become clear over time.

Although the effectiveness of the Ministry of Environmental Protection has been reduced by regulation enforcement problems, the commitment of this agency to environmental protection, both before and since its elevation to ministerial status, is not in doubt. In its previous form as the State Environmental Protection Agency, it was known as a policy innovator on environmental issues and aggressively pursued its environmental protection agenda, albeit often with very limited success. Ministry of Environmental Protection Vice Minister Pan Yue, an outspoken advocate of environmental causes and of greater transparency in environmental decision making, has been a voice for progress in the environmental bureaucracy. Dr. Schwartz testified that an increasing number of central government officials are participating in high-profile activities intended to confirm awareness of environmental problems and demonstrate a commitment to resolving them. Nonetheless, the central government has not placed its full weight behind environmental protection and pollution prevention and abatement. From his research, Dr. Schwartz has concluded that "China has the potential to utilize its state capacity to more effectively address its environmental challenges, but it does not choose to do so."<sup>130</sup>

Principal Deputy Assistant EPA Administrator Fulton testified that China, if it intends to bring about a major change in commitment to and enforcement of environmental protection policies, needs to adopt a broader social commitment that places a premium on environmental protection.<sup>131</sup> If it does this, a key instrument it can tap to assist its efforts is the environmental government-organized civil society organizations that have begun to emerge in China. Operating as quasi-governmental entities, these organizations aid in highlighting local pollution or enforcement problems but avoid involvement in policy matters.<sup>132</sup> Government-organized environmental groups have increased in number, professionalism, and visibility due to help from international environmental organizations and generally favorable treatment by the Chinese media.<sup>133</sup> Nonetheless, until environmental problems become a higher political priority at all levels of government, the effectiveness of these public efforts is likely to be constrained.

### **The Terminology Used to Describe Nongovernmental Organizations (NGOs) in China**

The United States and China both use the term “nongovernmental organizations” to describe organizations that work outside formal government programs to promote, inter alia, civil society development, environmental protection, and health and safety. However, nongovernmental organizations in China and in the United States are not the same. The Chinese government has a hearty suspicion of NGOs in the West, especially given the role that these groups played in fomenting the “color revolutions” in Georgia, Ukraine, and Kyrgyzstan.<sup>134</sup> To ensure that civil society groups in China cannot challenge the existing power structure, China has adopted a system that allows organizations to operate under close supervision of the government, and while they ostensibly function as nongovernmental organizations, these groups more accurately can be described as quasi-governmental organizations. They must be registered and officially sponsored by agencies in the PRC government. They cannot operate freely outside this sponsorship, and they generally follow government policy closely.<sup>135</sup> For this reason, the Commission has termed these groups “government-sponsored organizations,” believing that this term more accurately reflects their true nature. In China, there are more than 2,000 registered organizations that work on environmental issues.

To be sure, a number of unregistered civil society organizations operate in China, and these groups more closely reflect the western concept of nongovernmental organizations that truly operate independent of the government. According to Jennifer Turner, director of the China Environment Forum at the Woodrow Wilson International Center for Scholars, there are at least as many unregistered environmental groups as registered groups.<sup>136</sup> But because the unregistered groups operate outside government control, they risk raising the ire of the PRC government if they are too vocal or active.

Public participation has been a key factor in motivating democratic governments, including the United States, to take effective action to fight pollution. In many cases, publicly organized groups have challenged the government’s regulation of pollution and have brought cases against industrial waste producers. In China’s Communist system, the absence of broad public participation in government processes may prove a serious constraint to the central government’s stated desire to clean up pollution because it discourages public action and initiative, limits the ability of the people to hold their government accountable, and leaves all hope for action in the central Communist Party and its local affiliates.

### **U.S.-China Cooperation to Address Institutional Challenges**

The success of cooperative activities often hinges on one partner’s ability approximately to match the efforts and capabilities of the other. For this reason, several U.S. government programs and pro-

grams operated by other actors are directed toward facilitating China's efforts to reduce and mitigate pollution and have focused on improving the responsiveness and effectiveness of China's energy and environmental institutions. One method of doing this is to improve the capability of the institutions' personnel by offering training, exchanges, and technical education. Mark Levine of the Lawrence Berkeley National Laboratory leads that laboratory's China Energy Group that has been involved for several years in providing training programs that transfer technical skills to Chinese environmental protection personnel for developing appliance standards and fuel economy standards for vehicles. In the 1990s, the laboratory initiated a program in China to provide training for the design, analysis, and implementation of appliance energy efficiency standards. Dr. Levine testified that this program was launched after China's government assured it would establish appliance standards following this training. Eighteen months after the training, the government indeed issued efficiency standards for refrigerators and, since that point, has issued efficiency standards for 21 other household appliances and products.<sup>137</sup>

In developing fuel economy standards, Chinese researchers and officials worked with the Energy Foundation from 2002 to 2003 to assess world fuel economy standards. Dr. Levine explained, "The Chinese [participants] were made aware of the approaches that other countries used to establish the standards, the levels of the standards selected, their feasibility, the costs, the ways of implementation, the approach to developing test procedures for vehicles, the applicability of the standards to different types of vehicles, and a very wide array of other information."<sup>138</sup> Utilizing this research, the PRC government enacted its own standards in 2004, and the Energy Foundation assessed the implementation of the new standards and made recommendations for improvement.<sup>139</sup>

Acting Assistant Secretary of Energy for Policy and International Affairs Katharine Fredriksen provided another example when she noted that the Department of Energy is working with the National Development and Reform Commission to demonstrate how to conduct energy use audits of energy-intensive enterprises in China. This training program was a result of the U.S.-China Energy Policy Dialogue meeting in September 2007 and is an example of how U.S.-China cooperation can promote knowledge transfer as well as demonstrate to state-owned industries how to improve their own energy management.<sup>140</sup> The goal for the program is to provide technical support to assist the Chinese government in meeting its goals to reduce emissions and energy intensity in the 1,000 largest energy-consuming companies, identified by the Chinese under the "Top-1,000 Energy-Consuming Enterprises Program." Under this program, Chinese auditors will travel to the United States to receive training in energy audits and how to train others to conduct such measurements, and U.S. auditing teams will travel to China to demonstrate how to conduct audits. Acting Assistant Secretary Fredriksen indicated that these types of training programs can assist the integration of policies across different departments of China's central government as well as in industries that may have interests in promoting more efficient and cleaner use of energy. Further, this interaction affords participants the opportunity to de-

velop international and domestic networks with experts and officials holding similar responsibilities. While the exchanges have been delayed and will not occur in 2008, Department of Energy officials expect them to occur early in 2009.<sup>141</sup>

U.S.-China cooperation also is seeking to address the problems between the central government and local governments discussed above, especially through the U.S. EPA's support of the Ministry of Environmental Protection's Regional Supervision Centers. These centers were created to link central government policy with local government implementation and are located in Beijing, Xian, Shenyang, Chengdu, Guangzhou, and Nanjing.<sup>142</sup> While Principal Deputy Assistant EPA Administrator Fulton acknowledged that the mandates and resources of these centers are limited, the U.S. EPA is working with the centers to improve their environmental enforcement capability.<sup>143</sup> In addition, both the U.S. Environmental Protection Agency and China's Ministry of Environmental Protection added an annex to their Memorandum of Understanding in December 2007 containing an agreement to partner on helping both central and subnational governments to strengthen enforcement and compliance inspection programs between levels of government.<sup>144</sup> The Department of Energy also is beginning a program called "eco-partnerships" that enables and encourages city governments in the United States and China to collaborate on learning how to implement better municipal policies for energy use and how to promote the local development of alternative energy sources with private sector participation.<sup>145</sup>

Witnesses told the Commission that taking this approach at a subnational or even factory level could yield positive results by addressing the enforcement gap and working to inculcate an understanding among local governments and industries that failure to resolve environmental problems eventually will result in a slowdown of economic growth because the environment no longer will be able to sustain it.<sup>146</sup>

### ***Opportunities for Further Cooperation***

Witnesses at the Commission's August 2008 hearing highlighted other opportunities for cooperation to improve China's energy governance. China has attended meetings of the International Energy Agency (IEA) (as an observer since it is not a full member) and participated in IEA Emergency Response Exercises. Currently, eligibility for membership in the IEA requires a country to belong to the Organization for Economic Cooperation and Development (OECD) and that, in turn, requires a country to have a democratic government. However, Acting Assistant Secretary Fredriksen told the Commission that there have been preliminary discussions about the possibility of changing the requirements for IEA membership, especially given that some nations with emerging economies, including China, which is the world's second-largest consumer of oil, do not satisfy OECD membership requirements.<sup>147</sup> If China were to participate fully as a member of the IEA, its membership would provide opportunities for strengthening its participation in the world's oil market, international oil policy formulation, and strategic reserve management activities.

Witnesses at the August hearing emphasized how important it is for China to increase its willingness and improve its ability to collect and report energy statistics. In this vein, China has agreed to participate in the Joint Oil Data Initiative, an effort to alleviate oil supply uncertainty among oil producers and consumers by collecting and sharing data. In June 2008, China and other nations represented at the G-8+3 Energy Ministers' meeting committed to participate fully in this initiative.<sup>148</sup> Full participation requires full disclosure of China's oil demand, production, and reserves statistics, and it is the belief of the members of this initiative that access to such information will bring about greater security and transparency in the oil market.

China's environmental data collection has problems and shortcomings comparable to those in its collection of energy data. Dr. Joanna Lewis told the Commission that China's collection of carbon dioxide emissions data is severely lacking. She indicated that, based on her experience, collecting reliable carbon emissions statistics can be very difficult because the results often rely on industry-level data, and she offered the opinion that China needs assistance in designing data collection efforts and mechanisms, monitoring the collection systems, and using the data to model and project emissions patterns. She further noted that having a functional national emissions inventory system is a crucial step toward equipping the government to adopt and enforce emissions reduction policies.<sup>149</sup>

Dr. Jonathan Schwartz highlighted in his testimony that China's government-sponsored environmental organizations can make significant contributions to increasing the government's accountability and transparency but that those groups need international recognition and support if they are to survive and fulfill the very important role they can play in China:

*Direct and indirect funding for activities and training of China's environment community is the most obvious option. Another important form of support is global public attention. Any environmental organization that tests the political limits on behavior faces the threat of government sanction. However, global public attention and support for such organizations raises their profile and constrains the Chinese state from taking action against these groups with impunity.<sup>150</sup>*

## **Addressing the Environmental Impacts of China's Energy Consumption**

### ***China's Domestic Energy Use and Pollution***

The PRC government has promulgated several policies and initiatives intended to improve energy efficiency, reduce energy consumption, and reduce pollution. Because environmental conditions are inextricably intertwined with energy consumption, the government's energy policies will significantly affect environmental pollution.

In its first energy White Paper released in December 2007, the Chinese government assigned a high priority to sustainable, balanced development that promotes economic growth but recognizes

that growth must occur in an environmentally conscious manner. A key feature of this policy is the promotion of resource conservation through improved energy efficiency and resource allocation. Beyond the White Paper, the government has enacted various policies and regulations intended to control the pace of energy consumption. For example, in 2005, the Chinese government in its 11<sup>th</sup> Five-Year Plan (2006–2010) announced several goals for reducing energy consumption. The plan's most ambitious target (and one that many energy experts say will be difficult, if not impossible, for China to meet) requires a 20 percent reduction in China's energy intensity (the amount of energy used to produce one unit of gross domestic product [GDP]) by 2010.<sup>151</sup> China has reported decreases in energy intensity for the past two years, and in 2007 most of China's regions achieved energy intensity reductions of 4 percent.<sup>152</sup> However, the 11<sup>th</sup> Five-Year Plan has passed its halfway point, and Principal Deputy Assistant EPA Administrator Fulton acknowledged that while it is unlikely China will meet its national goal, a more accurate assessment of China's progress requires current information on China's energy intensity that is not currently available.<sup>153</sup> Given that 60 percent of China's energy consumption is attributable to industrial production, one of the primary strategies to achieve this goal has been to improve industrial energy efficiency.<sup>154</sup> In 2007, coastal industries reported an average 7.26 percent reduction in energy intensity, with central and western industries reporting 6.84 percent and 6.71 percent, respectively.<sup>155</sup>

To address industrial consumption, the government is focusing on consolidating the industries it has identified as the "Top-1,000 Energy-Consuming Enterprises"—that account for nearly a third of national energy consumption and half of all industrial energy use—and is investing in long-term, energy-saving technologies and production methods. This initiative primarily targets industries producing aluminum, steel, cement, petroleum and petrochemical products, and glass.<sup>156</sup> All the enterprises participating in the program have signed agreements with local governments to reach energy targets by 2010, and, while the program is in the middle of its operation, preliminary evaluations indicate that some reductions in energy intensity have occurred. A report issued in 2007 by the Lawrence Berkeley National Laboratory stated, "In fact, NDRC recently reported that the steel industry—which is the sector with the largest number of enterprises and highest total energy consumption in the Top-1,000 program—experienced a decrease in overall energy consumption of 8.8 percent from 2005 to 2006 and unit energy consumption for producing one ton of steel declined 7.1 percent."<sup>157</sup>

The government also has increased the export tax on energy-intensive industries and reduced import tariffs on energy and resource products such as coal, aluminum, and petroleum. According to Dr. Joanna Lewis, this intended to promote the utilization of energy-intensive products produced elsewhere. In November 2006, the Ministry of Finance increased the export tax on copper, nickel, and aluminum by 15 percent; on steel primary products by 10 percent; and on petroleum, coke, and coal by 5 percent.<sup>158</sup> Additionally, a March 2008 policy—announced, interestingly, by the National Development and Reform Commission rather than by the more envi-

ronmentally friendly but less powerful Ministry of Environmental Protection—prohibits high-polluting firms from listing on the stock exchange.<sup>159</sup>

China is very concerned with ensuring the security of its energy supply and is diversifying its energy sources by making heavy investments in renewable energy sources and overseas oil production.<sup>160</sup> The 11<sup>th</sup> Five-Year Plan has identified a goal of increasing the share of renewable energy to 10 percent by 2010.<sup>161</sup> The National Renewable Energy Law extends that target, with the goal of obtaining 16 percent of primary energy from renewable resources by 2020, and government policies are supporting this investment.<sup>162</sup> Some gains have been made. China's installed wind power capacity is projected to reach 10,000 megawatts by the end of 2008 and 20,000 megawatts by 2010.<sup>163</sup> Hydropower capacity is projected to more than double by the year 2020, although, as Dr. Joanna Lewis noted, the realism of this projection is questionable, since achieving it would require building a new dam equal to the size of the Three Gorges Dam every other year.<sup>164</sup> In addition to infrastructure limitations, water shortages in China may make this projection unattainable.

The government also is promoting energy technology development and is emphasizing clean coal technologies and advanced nuclear energy technology. The December 2007 White Paper highlights the importance of foreign investment in energy projects in China as a means to finance the development of these new technologies and to encourage their deployment.<sup>165</sup> As a result of this prioritization and China's consequent investments, Acting Assistant Secretary Fredriksen testified that China probably will leapfrog the United States in developing coal-to-liquids technology and viable production units. China has agreed to adopt indirect liquefaction techniques that will allow for greater capture of carbon.<sup>166</sup>

China's current environmental protection priorities are laid out in the 11<sup>th</sup> Five-Year Plan for Environmental Protection and include reducing sulfur dioxide emissions by 10 percent by 2010 (sulfur dioxide emissions react in the atmosphere to cause acid rain).<sup>167</sup> In 2006, sulfur dioxide emissions increased, but this trend reversed in 2007 when SO<sub>2</sub> emissions fell 3.16 percent,<sup>168</sup> and in the first half of 2008, emissions dropped again—by 3.96 percent compared to the same period in the previous year.<sup>169</sup> While emissions are decreasing, China will have to make dramatic achievements in the next two years to meet its 2010 goal.

To mitigate the effects of emissions from China's growing vehicle ownership, China has instituted strict tailpipe emissions standards and fuel economy standards for passenger vehicles; in fact, these are stricter than the U.S.' standards. However, as Principal Deputy Assistant Administrator Fulton pointed out, this initiative is incomplete because meeting these strict emissions standards will require a dependable supply of low sulfur fuel that China does not yet have. Furthermore, institution of these standards alone will accomplish nothing; strict government enforcement will be required.

During the Commissioners' April 2008 visit to Taiyuan in Shanxi Province, city and provincial government representatives indicated that a long-term goal for the area is to modernize its steel and energy industry to reduce pollution and improve environmental con-

servation. Officials highlighted the planting of “green belts” in the province, areas in which the government has planted thousands of trees with the aim of reducing carbon dioxide.

Other environmental policies have included the “green credit” policy, a cooperative effort by the Ministry of Environmental Protection, the People’s Bank of China, and the China Banking Regulatory Commission to deny bank credit to firms that are serious polluters. This policy may prove difficult to implement at the local level because, as addressed previously in this section, most local officials prioritize economic growth over environmental policy enforcement, and because polluting companies may be denied the financing they need to invest in cleaner technologies.<sup>170</sup>

An alternate program to encourage industry action was discussed during the Commissioners’ April 2008 visit in Hong Kong. Hong Kong’s Secretary of the Environment Edward Yau told Commissioners that Hong Kong has signed an agreement with Guangdong Province to cooperate on reducing air pollution by imposing binding caps on four major pollutants. The Hong Kong government has provided funding for Hong Kong companies to clean up their production operations in Guangdong, and five major banks in Hong Kong have agreed to provide up to 100 percent financing for “green” projects on the mainland. In addition, Hong Kong will serve as a mentor for Guangdong Province to assist it to address environmental issues and set priorities for action.

With regard to public participation, China enacted an Environmental Impact Assessment law that took effect in September 2003. Under this law, citizens now can request public release of legally required environmental impact assessments of proposed construction projects such as power plants or chemical factories and also can appeal to the central government the project plans based on the results of those assessments or if an assessment has not been properly conducted. However, many projects covered by the law proceed without submitting the assessment. Interference by local officials on behalf of profitable enterprises and the lack of judicial independence in China often result in failure to enforce environmental laws.<sup>171</sup>

### ***The Global Environmental Impacts of China’s Energy Use***

The Chinese government acknowledges the existence of dramatic climate changes and their negative impact on China.<sup>172</sup> In 2007, it released a report, *National Climate Change Program*, recognizing the findings of the Third Assessment Report of the United Nations (UN)-sponsored Intergovernmental Panel on Climate Change that concluded that the warming of the earth’s temperature over the past 50 years was likely due to the increase of greenhouse gases, including CO<sub>2</sub>, primarily produced from human activity. Within China, changes in the country’s average temperature, precipitation levels, and sea level have been documented. *National Climate Change Program* reports that the annual average air temperature in China has increased between 0.5° and 0.8° centigrade during the past 100 years, slightly more than the global average. Annual precipitation has changed according to region: northern and northwestern areas have seen a decrease in rain—in some areas a significant decrease—and southern and southwestern areas have seen

an increase. Extreme weather events such as floods and droughts have become more common in the past 50 years.<sup>173</sup> The country's glaciers also have retreated.<sup>174</sup> The United Nations (UN) Intergovernmental Panel on Climate Change reported that glaciers in the Himalayas are retreating faster than any other glaciers in the world, and China's director of the Institute of Tibetan Plateau Research Yao Tandong found that China's 46,298 glaciers have retreated 7 percent from 1960 to 2000.<sup>175</sup> Glacial runoff from the Himalayas supplies freshwater for rivers flowing through China and South and Southeast Asia. Scientists report that 1.3 billion people will be affected by the melting of these glaciers because of the floods that will result from faster melting and the diminution of freshwater supplies on which they rely.<sup>176</sup>

### ***Greenhouse Gas Emissions***

To combat these changes, *National Climate Change Program* identifies policies and objectives for reducing the country's greenhouse gas emissions. China's strategy for controlling carbon dioxide emissions has focused on reducing the country's energy intensity. If achieved, China's ambitious goal of reducing its energy intensity by 20 percent between 2005 and 2010 will produce an annual reduction of over 1.5 billion tons of CO<sub>2</sub>.<sup>177</sup> However, scientists are skeptical of China's ability to meet this target because to date it has not achieved its 11<sup>th</sup> Five-Year Plan goals for reducing energy intensity.<sup>178</sup>

### ***Reducing Coal Emissions***

Shanxi Province has the greatest coal production and coal reserves of any area in China. During the Commission's 2008 visit to Taiyuan in that province, the Commission learned that the Taiyuan power bureau, a provincial company, has formed a joint venture with Rockwell Automation to produce equipment to control coal emissions. Additionally, Commissioners learned that power generation, steel, and concrete plants in the area do not always utilize pollution control equipment. Reducing coal emissions in China will require not only the availability of technology and equipment but also the willingness of businesses and companies to put such equipment to use.

Because of the extent to which coal combustion is responsible for China's current and projected carbon dioxide emissions, the only ways China will be able to significantly reduce its CO<sub>2</sub> emissions are (1) to reduce its dependency on coal and/or (2) to find a way to capture the emissions from its coal-fired power plants.

China also is pursuing development of carbon capture technology. In a joint project with Australia, China Huaneng Group, China's largest power company, will test a post-combustion capture (PCC) pilot plant in Beijing. With PCC technology, emissions from power stations are passed through an absorbent solution that contains a chemical to capture carbon dioxide.<sup>179</sup> Moreover, China has initiated a program, called GreenGen, based on the U.S. FutureGen Alliance program, that develops clean coal technology. GreenGen Co. operates as a subsidiary of China Huaneng Group. GreenGen is building a 250 megawatt coal-based power plant using Inte-

grated Gasification Combined Cycle technology. This technology turns coal into gas, cleans the impurities from the coal gas, and thus reduces emissions. Once this first phase is completed at the end of 2009, plant capacity will be expanded to 650 megawatts, and carbon capture and sequestration technology will be added.<sup>180</sup> The program's goal is to capture and sequester between 1 million and 1.5 million tons of carbon dioxide, or 80 percent of the plant's carbon emissions, and the expected completion date is 2020.<sup>181</sup>

One alternative to coal combustion for power generation is nuclear power. Nuclear power plants pose their own—and vexing—specialized pollution problems, but they are airborne emissions free. China's low-level radioactive waste is disposed in near-surface and above-ground facilities in several locations around the country, and scientists are in the process of studying five potential sites for deep geologic disposal of high-level waste.<sup>182</sup> If China meets its 2030 goal of generating 20 percent of its electricity needs with nuclear power, it will reduce its projected carbon dioxide emissions by 1.2 billion metric tons per year.<sup>183</sup> At present, 21 new nuclear plants are under construction or have been approved by the State Council to begin construction, adding to China's existing 11 plants that supply 2.4 percent of current electricity consumption.<sup>184</sup>

### ***International Efforts to Reduce Greenhouse Gas Emissions***

Some nations, including most European countries as well as Australia and Japan, have been engaged in diplomacy with China in an effort to persuade China to ramp up its contributions to reducing carbon emissions. China signed bilateral climate change agreements with Norway in March 2007 and France in November 2007 and in April 2008 agreed to hold annual ministerial talks with Australia on mitigating climate change.<sup>185</sup> Further, the PRC government has ratified the United Nations Framework Convention on Climate and the Kyoto Protocol. China has very limited obligations under the protocol because it is classified as a developing country; China is obligated to monitor and report on its emissions but not to meet specific emissions reduction targets.<sup>186</sup> Not surprisingly, China prefers this designation and approach.

The PRC government has been supportive of international efforts to plan beyond the Kyoto Protocol. It advocated broad participation in the UN Climate Change Conference in Bali in December 2007 and supports the two-year negotiation process launched at the Bali Conference to create a plan for fighting global emissions that is intended to replace the Kyoto Protocol in 2013. The next meeting for these negotiations will occur in Poland in December 2008, and the process is expected to conclude at the end of 2009 in Denmark.<sup>187</sup>

China has emerged as the leading host country for the Clean Development Mechanism, a product of the Kyoto Protocol. It "allows for the industrialized countries with emissions targets under Kyoto to meet their commitments in part by financing projects that lower greenhouse gas emissions in developing countries."<sup>188</sup> China is expected to generate 1.2 billion tons of carbon dioxide credits by the end of 2012, which will account for more than half of all the certified emission reduction credits in the program.<sup>189</sup>

China argues that developed countries are the primary cause of climate change and therefore places primary responsibility for re-

ducing emissions on those countries rather than on China and other developing countries, a concept identified as “common but differentiated responsibilities.”<sup>190</sup> The United States *is* the largest historical greenhouse gas emitter and far exceeds China in emissions per capita.<sup>191</sup> However, in the past two years China has overtaken the United States in total production of greenhouse gas emissions. All projections indicate that, in the absence of major energy consumption changes in China, both China’s aggregate emissions and its share of global emissions will continue to increase dramatically for the foreseeable future. The consequent reality is that it will be impossible for the international community to resolve the climate change problem by sufficiently reducing emissions unless China contributes to the effort. The solution also is unachievable unless the United States—as currently the world’s second largest emitter and the largest historical emitter of greenhouse gases—makes a substantial contribution. Any efforts to address this problem will require global participation by developed and developing nations.

In looking toward what the dimensions of such a solution might be, witnesses suggested rethinking fundamentally how the world views this problem and how different countries’ mitigation obligations are defined. The global economy—and China’s position within it—has changed drastically since the 1992 UN Framework.<sup>192</sup> Joseph Aldy, a fellow at Resources for the Future and co-director of the Harvard Project on International Climate Agreements, argued in his testimony to the Commission that in any future negotiations, the entire framework of the climate change agreement should be revisited with this key fact in mind. He testified that “. . . the emergence of some countries, including China, suggests the need to reevaluate the division of effort under international climate policy and find ways to ‘graduate’ emerging economies to a status in which they will be expected to exert more effort to mitigate climate change.”<sup>193</sup> According to Dr. Joanna Lewis, one of the PRC government’s concerns is that if it adopts a more proactive approach such as being willing to accept binding commitments, it will step out of its designation as a developing country and will be asked by both developed and developing nations to assume greater responsibility.<sup>194</sup> Both witnesses observed that the block of developing countries has recognized the changes and growth in China, and quite possibly those countries may expect more action and commitment from China than was previously expected.<sup>195</sup>

China believes that binding commitments may tie its hands and slow its economic growth. The central government regards increasing energy use and increasing carbon emissions as inevitable by-products of development. In many cases, there is a “pollute now, pay later” attitude.<sup>196</sup> As a 2007 NDRC report explains, “To reach the development level of the industrialized countries, it is inevitable that per capita energy consumption and CO<sub>2</sub> emissions will reach a fairly high level. In the development history of human beings, there is no precedent where a high per capita GDP is achieved with low per capita energy consumption.”<sup>197</sup> Consistent with the priority the PRC government attaches to continuing a high rate of economic growth, China so far has been unwilling to accept any binding commitments that may stifle its development.<sup>198</sup>

Obtaining sufficient movement from China will be a daunting challenge, especially due to its overwhelming dependence on coal as its primary source for electricity. The PRC government recognizes that for the foreseeable future China will remain dependent on coal as its primary energy source.<sup>199</sup> Thus, with regard to any future climate change proposals, China most likely will seek either to resist emissions caps or to obtain commitments from industrialized nations to supply clean energy technology. Like the United States, China has opposed emissions caps. It has argued for a “no targets and no timetables” approach to encourage developing countries to reduce emissions, consistent with its position that primary responsibility for reducing emissions should lie with the developed world. Dr. Joanna Lewis testified that it would be more technically and political feasible for China to commit to emissions reductions linked to economic growth, but this is unlikely to result in an absolute decrease in emissions<sup>200</sup> and instead may only slow the rate of growth. It will require historically unprecedented diplomatic and technical creativity to overcome these obstacles and secure a satisfactory agreement and then ensure adherence to it.

#### **U.S.-China Cooperation to Address the Environmental Impacts of China’s Energy Consumption**

In addition to cooperating with China to assist its efforts to design and implement institutional reforms and to build capacity in its implementation of policies, the U.S. government and other actors are engaged with China in multiple projects to address directly the environmental consequences of China’s energy use. This Report will highlight only a few of them. In June 2008, at the fourth meeting of the Strategic Economic Dialogue (SED), the United States and China signed a 10-year energy and environment cooperation framework centered on five initial goals:<sup>201</sup>

- Clean, Efficient, and Secure Electricity Production and Transmission
- Clean Water
- Clean Air
- Clean and Efficient Transportation
- Conservation of Forest and Wetland Ecosystems

This framework involves departments and agencies across both countries’ governments. For the United States, the departments of Energy, the Treasury, State, and Commerce, and the Environmental Protection Agency are participating. Acting Assistant Secretary Fredriksen testified that the Department of Energy is responsible for the task forces working on electricity production and transportation. She stated in her testimony that the task forces for all the identified goals are working with their Chinese counterparts to develop action plans by December 2008, the proposed date of the next SED meeting.<sup>202</sup>

According to the U.S. Department of the Treasury, “The Cooperation Framework has been structured to foster extensive collaboration over a ten year period to address the challenges of environmental sustainability, climate change, and energy security.”<sup>203</sup> While the framework does not address directly the U.S.’ and China’s differing positions on climate change, successful implementa-

tion of the framework's goals could reduce the growth of carbon dioxide emissions in China. In his testimony to the Commission, Lawrence Berkeley National Laboratory's Dr. Levine urged that the U.S. government take this cooperation one step further by conducting a bilateral dialogue specifically on the subject of finding a common position for reducing greenhouse gas emissions, noting that U.S.-China cooperation on the issue could influence the course of global negotiations.<sup>204</sup>

U.S.-China cooperation also addresses one of China's greatest energy and environmental challenges—its dependence on coal and the emissions that coal combustion produces. Under the U.S.-China Fossil Energy Protocol, the two nations are cooperating to construct the first commercial-scale coal liquefaction facility using U.S. technology. In the Commission's 2007 Annual Report to Congress, the FutureGen program and China's involvement were highlighted as an opportunity for the joint development of clean coal technology. In January 2008 this program was restructured, and under the current guidelines international actors wishing to participate must submit new proposals. Under the new FutureGen plans, the program will focus on carbon capture and storage techniques in multiple power plants to develop near-emissions-free production. Acting Assistant Secretary Fredriksen stated, "Taking advantage of research and development in [carbon capture and storage], integrated gasification combined cycle, and pulverized coal technology, this approach will permit the demonstration plants to capture and sequester twice the carbon dioxide as the original 2003 FutureGen plan."<sup>205</sup>

The U.S. EPA also is involved in projects to address China's environmental pollution, with projects on air quality management, emissions inventories, methane capture and use, and emissions control from heavily polluting industries such as cement.<sup>206</sup> Principal Deputy Assistant EPA Administrator Fulton testified that EPA also is working with China to implement a sulfur dioxide emissions trading system.<sup>207</sup> EPA is collaborating with China through multilateral frameworks such as the Asia Pacific Partnership on Clean Development and Climate that is designed to "accelerate development and deployment of clean energy technologies, and to help meet energy security, air quality, and climate change goals in ways that promote sustainable economic growth and poverty reduction."<sup>208</sup>

### ***Opportunities for Further Cooperation***

In testimony before the Commission, witnesses highlighted the importance of technology transfer to China as a necessary step for mitigating greenhouse gas emissions. China advocates the use of tax breaks or other financial incentives to encourage developed countries to accelerate the pace and broaden the scope of such technology transfers, and it has pursued this agenda in bilateral as well as multilateral negotiations. Dr. Levine testified that China's primary technical need is the development of low-carbon technologies. He advocated pursuing joint development of these technologies and establishing procedures for sharing the associated intellectual property.<sup>209</sup> Dr. Aldy also highlighted in his testimony the importance of developing carbon capture and storage tech-

nology and finding ways to make use of that technology commercially viable in both the United States and China.<sup>210</sup>

Witnesses noted that China remains skeptical about the U.S.' commitment to change its energy consumption patterns and combat climate change. They suggested that the U.S. government could illustrate its commitment through technology transfers related to climate change. Part of the debate in the United States about transferring technology to China focuses on whether China should pay for the technology and whether it should receive it without conditions. Dr. Aldy noted that energy and environmental technology transfers do not necessarily have to be made without conditions. For example, the transfer of technologies could require implementation and enforcement of stricter efficiency standards or of a carbon tax policy.<sup>211</sup>

#### **Barriers to the Transfer of Environmental Goods**

As a developing country, China has advocated the transfer of energy-saving technologies and alternative energy technologies from developed countries to developing countries. One barrier to expanding such transfers is the concern by western manufacturers about China's lax enforcement of intellectual property rights and the economic losses associated with stolen intellectual property. Many western firms are reluctant to bring high-value technologies into China out of fear that reverse engineering or outright theft of technology designs may occur. Until intellectual property is respected and protected in China, and until violations are vigorously and effectively prosecuted, the transfer of new technology to China will be delayed in many cases.

Additionally, in the past, the PRC government has criticized the United States for restricting high-tech exports to China based on national security concerns, but restrictions on transfer of environmental technologies have originated in China in the form of trade barriers. Import tariff and nontariff barriers serve as pronounced disincentives for the U.S. business community to sell environmental technologies, goods, and services to China.

The issue of tariffs on environmental goods has been debated bilaterally in the U.S.-China Strategic Economic Dialogue and multilaterally, including in the just-ended Doha Round of World Trade Organization (WTO) negotiations. U.S. Treasury Secretary Henry Paulson has urged China to lift its import barriers on environmental technologies, and in May 2007, both countries signed an agreement to work together to reduce or eliminate tariff and nontariff barriers to trade in environmental goods and services.<sup>212</sup> Eliminating or at least reducing tariffs on imported environmental goods appears to offer a win-win proposition for the United States and China. However, the United States and China have been unable to agree on a list of technologies and services aimed at reducing greenhouse gas emissions for which tariffs could be reduced. A schedule for tariffs cannot be established until agreement can be reached on a list of what qualifies as an environmental good.

### **Barriers to the Transfer of Environmental Goods—Cont.**

During the Doha negotiations in November 2007, the United States and the European Union proposed a list of 43 goods, including solar panels, boilers, and thermostats, but China and other developing countries advocated a project-based approach under which individual countries could identify goods as “environmental goods” when included in a national project with an environmental objective.<sup>213</sup> In addition to this disagreement, Brazil desires to include biofuels (considered to be an agricultural product) as an environmental good, although the other goods on the proposed tariff lists are all industrial goods. The United States and the European Union oppose this suggestion. It appears that China may find this deadlock convenient for delaying movement on this issue.

China is investing heavily in developing its own clean energy technologies and may decide that protecting these nascent operations is more important than opening its market to new technologies.<sup>214</sup>

### **Conclusions**

- China’s energy and environmental policy institutions are weak, and without significant support and strengthening by the PRC leadership, these institutions will be incapable of reversing the trends of China’s energy consumption and environmental pollution.
- The most obvious explanation for the weakness of China’s energy and environmental institutions is the government’s lack of commitment to devote the necessary resources to achieving substantial progress in these arenas. The government demonstrated in its preparations for the Beijing Olympic Games that it has the ability to use governmental mechanisms to develop and enforce environmental policies to achieve its objectives—specifically improving the quality of Beijing’s air.
- Given the transboundary environmental impact of China’s unbridled energy consumption, the United States has a keen interest in supporting China’s energy and environmental bureaucracy to improve its transparency, expertise, and capacity to promulgate and enforce regulations designed to reduce emissions and increase energy efficiency.
- Chinese leaders are aware of the need to moderate the growth of energy consumption and to improve energy efficiency but to date they have not made a commitment to reduce carbon dioxide emissions at the cost of economic development.
- China participates in multilateral negotiations to address climate change but has major difficulty supporting an agreement that requires it to reduce its net emissions. Chinese negotiating efforts attempt to shift the burden to reduce emissions to developed, industrialized nations and to escape being placed in this group.

- As the negotiations for a post-Kyoto climate change mitigation framework move forward, the United States and China have a joint interest in cooperating to influence the outcome of the negotiations and to resolve their bilateral differences in order to achieve a mutually acceptable solution and a shared understanding of each country's commitments under the agreement.
- Without a reduction in tariffs, and effective protection for intellectual property rights and technology, it will be very difficult for American companies to participate in transferring energy and environmental technologies to China.