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**Crouching Sins, Hidden Potential:  
United States Environmental and Energy Cooperation with China**

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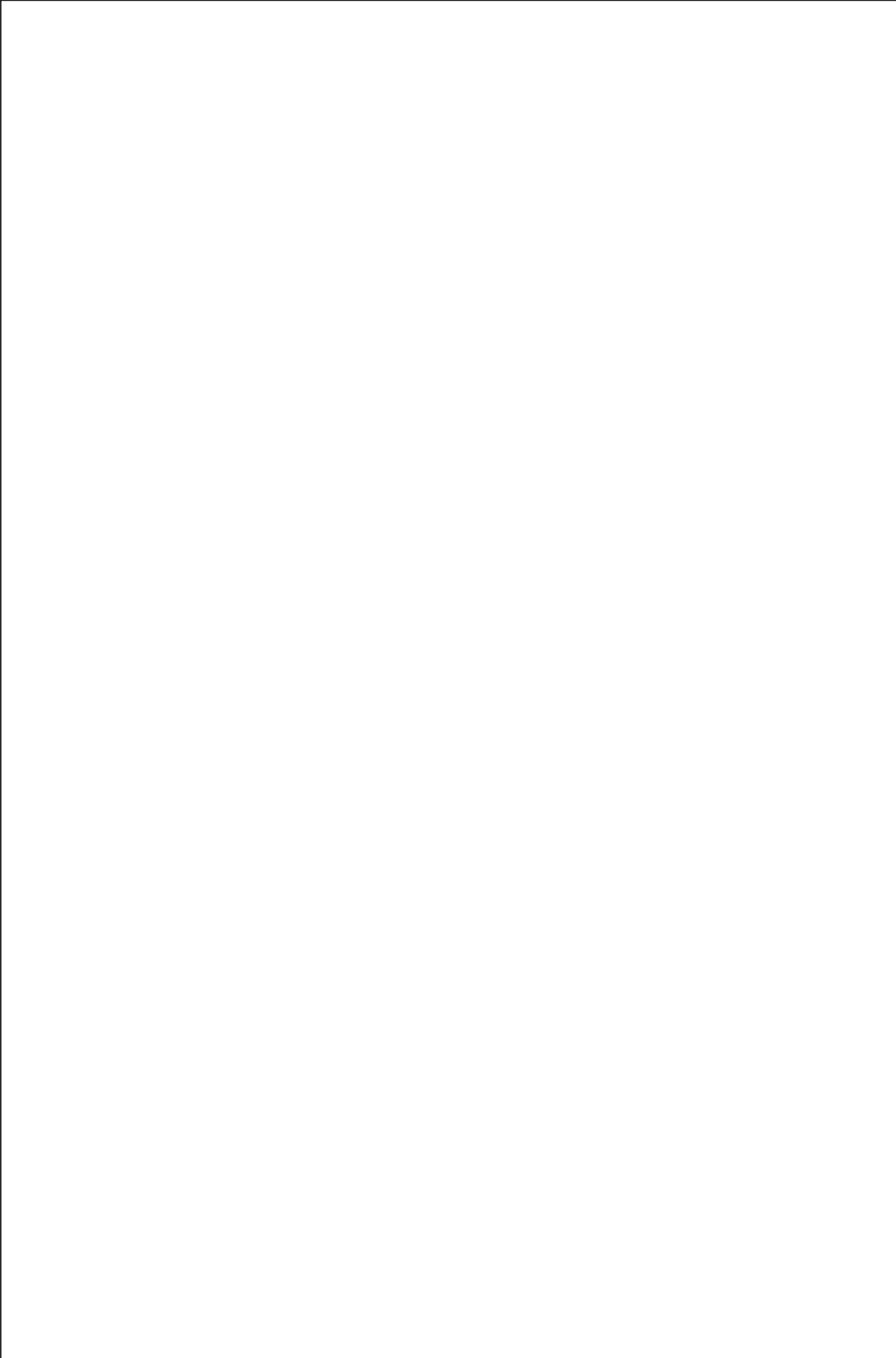
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## Acronyms and Measures

APEC	Asia Pacific Economic Cooperation
DoC	Department of Commerce (U.S.)





ECSP's China Environment Forum has published its fifth issue of the China Environment Series (CES). An annual journal for policymakers, researchers, educators, and environmental nongovernmental organizations (NGOs), CES features articles, commentaries, and meetings summaries that examine environmental and energy challenges facing China and explores creative ideas and opportunities for governmental and NGO cooperation.

### **Feature Article**

*China's "Go West" Campaign: Ecological Construction or Ecological Exploitation?*  
—Elizabeth Economy

*Searching for Energy Security: The Political Ramifications of China's International Energy Policy*  
—Philip Andrews-Speed, Xuanli Liao, & Roland Dannreuther

*Pesticides in China: A Growing Threat to Food Safety, Public Health, and the Environment*  
—Jessica Hamburger

*New Partners or Old Brothers? GONGOs in Transnational Environmental Advocacy in China*  
—Fengshi Wu

### **Commentary / Note From the Field**

*Looking into a Microcosm of China's Water Problems: Dilemmas of Shanxi—A High and Dry Province*  
—Jih-Un Kim

*Networking for Development of Legal Assistance to Pollution Victims in China*—Kenji Otsuka  
*Xinjiang: A Trip to the New Territory*—Wen Bo

*China's Nature Reserves: Protecting Species or Generating Profits?*—Lawrence Glacy

*The Yunnan Great Rivers Project*—Ou Xiaokun

*Environmental Action as Mass Campaign*—Jane Sayers

*Spray-Painting Change? Beijing's Green Olympics, NGOs and Lessons Learned from Sydney*  
—Timothy Hildebrandt

*Brick by Brick: Improving the Energy and Environmental Performance of China's Buildings*  
—Robert Watson & Barbara Finamore

*Lean and Green: Boosting Chinese Energy Efficiency through ESCOs*—Pam Baldinger

CES 5 includes summaries of China Environment Forum meetings as well as an updated and expanded "Inventory of Environmental Projects in China," which describes projects conducted by U.S. government agencies, U.S. universities, professional associations, and NGOs. This year's Inventory includes a significantly longer section on Chinese NGOs and environmental initiatives by other governments in China.

To obtain a copy of *China Environment Series* Issue 5 or inquire about contributing to future issues, please contact ECSP Senior Project Associate Jennifer L. Turner by email at [chinaenv@erols.com](mailto:chinaenv@erols.com) or phone at 202/691-4233. Copies may also be downloaded from the ECSP Web site at <http://ecsp.si.edu>.



## China's Impact on Global Energy Markets and Environmental Quality

Perhaps no country besides the United States will have greater impact on global energy and environmental strategies in the coming years than the People's Republic of China (PRC). The world's most populous nation already consumes more energy and emits more greenhouse gases than any country except the United States, and may surpass the United States in both categories within two to three decades. If China maintains economic growth rates of 5 to 7 percent per year its economy will increase three to fivefold by 2025—with enormous consequences for the rest of the world. Chinese experts predict that China's ability to meet energy demand from domestic sources will fall short by approximately 8 percent in 2010 and 24 percent in 2040—the resulting increased demand for energy imports could result in higher global energy prices.<sup>1</sup> Moreover, China's breakneck pace of modernization already has left it with nine of the world's ten most polluted cities and its sulfur emissions lead to acid rain throughout Northeast Asia. Even countries halfway around the globe are feeling the impact of China's pollution problems and inefficient use of natural resources—industrial contaminants and dust from China are now reaching the United States via the Gulf jet stream.

Despite these alarming trends and the growing role China undoubtedly will play in shaping future global energy markets and environmental trends, energy issues have not occupied a prominent position in U.S.-China relations. To the extent that energy and environmental issues have been considered at all, U.S. policy regarding cooperation with China in these areas has not been sustained or consistent, reflecting tensions in the U.S.-China relationship, disagreements between past administrations and Congress, and the higher priorities given to other issues in the relationship. The perceived incoherence of U.S. policy has not served well U.S. firms and citizens, the people of China, and key allies in the strategic East Asian region. President Bush's announcement during a February 2002 visit to Beijing to “take active efforts” to cooperate with China on energy and environmental protection marks a welcome departure from the administration's previous year of silence on these issues. However, it will be critical for U.S. credibility and strategic well being for the government to make good on this statement and genuinely move forward with an active agenda.

### Why Act?

Clearly, the onus for developing rational energy and environmental policies in China rests with the Chinese government and people. Indeed, China has taken several important steps over the past few years to become more energy efficient and reduce environmental degradation.<sup>2</sup> *U.S. policymakers, however, also should have a keen interest in the energy and environmental policies China adopts*, given the potential impact of these policies on the United States and the rest of the world.

It is strongly in the interest (politically and environmentally) of the United States to help China bolster its use of clean energy, energy efficient technologies, and energy conservation strategies in order to help prevent intensified competition for limited global energy

resources and further environmental degradation in the PRC. Moreover, in the aftermath of September 11, U.S. relations with China, which shares borders with both Afghanistan and North Korea, have gained greater strategic significance. Reaching agreement on sensitive security issues likely will prove difficult, especially without a reservoir of goodwill to draw from in other aspects of the relationship. As the United States and China share concerns over energy security and confront many of the same environmental challenges, cementing cooperation in these areas might help address not only immediate environmental concerns but also may help secure broader U.S. foreign policy and domestic goals, including:

- Improve U.S. and global energy security, for China's oil imports will increase over time and China may also play an important role in developing new pipelines in central Asia;
- Improve political and economic stability in a region of key economic and strategic interest to the United States by decreasing tension over energy supply, natural resource utilization, and environmental degradation issues in East Asia;
- Help offset tensions in other parts of the Sino-U.S. relationship;
- Promote sales of U.S. energy-efficient and environmental technology and services to China, a potentially huge—but fiercely competitive—market;
- Reduce the potential for ecological damage to the U.S. West Coast, Alaska, and Hawaii from Chinese pollution and dust storms;
- Decrease the likelihood of China becoming dependent on unstable oil-rich states—Chinese oil companies already have acquired concessions in Sudan, Iran, and Iraq;
- Demonstrate U.S. commitment to international environmental issues by engaging a key emerging nation;
- Improve cooperation between the United States and China on critical international environmental issues, such as climate change while encouraging China to become a leading example of “developing country participation” 39.9a pTqa.emergbolsTD0 T 0.12



Finally, security concerns and recent price fluctuations for oil and natural gas—both domestically and on international energy markets—give both countries motivation to reduce imports and improve energy efficiency. Price fluctuations are also spurring the development of alternative energy development in both the United States and China. The U.S. National Academy of Science has called for greater cooperation and research with China on such issues. Industry groups such as the U.S.-China Business Council and U.S. Chamber of Commerce also support greater cooperation with China on energy and environmental issues. Decisions regarding energy supply being made *now* by the Chinese leadership will have long-term impacts, and it is in the U.S. interest—strategically and commercially—to be as involved as possible in assisting China onto a more sustainable energy path.

This paper highlights opportunities for, as well as barriers to, U.S.-China energy and environmental cooperation. We conclude this paper with a range of policy options to help stimulate discussion of these issues amongst the Congress, administration, and others in the American policy community.

## The Environmental Situation in China Today

China is in the midst of two historic transitions: (1) from a rural, agricultural society to an urban industrial one, and (2) from a command economy to a market-based one. Over the past 20 years China has lifted an estimated 200 million people out of poverty and become the world's tenth largest trading economy. About one-third of China's population now resides in urban areas, and the figure is expected nearly to double by 2020. The speed with which China is accomplishing these social and economic transformations, however, is generating tremendous pressure on the country's social and natural resources. China's geography and enormous population—1.25 billion, with an additional 14 million added every year—further exacerbate the difficulty of developing adequate infrastructure and managing resources. On a global basis, China has 22 percent of the world's population living on 7 percent of the world's arable land. Per capita farmland, grassland, and water resources are less than one-third the world average. Forest and oil resources per capita are just one-tenth of the world average.<sup>3</sup> Large amounts of land are lost each year to desertification due to soil erosion from deforestation and over-grazing. Arable land and water resources are unevenly distributed between east and west, north and south. (See Tables 1 and 2 for an overview of China's environmental quality)

### E y

China's increasingly diversified economy has grown an average of 10 percent annually over the past two decades, making it one of the 10 largest in the world. This economic growth has been powered by considerable rises in energy consumption—China accounted for around 10 percent of global energy consumption in 1997 (second in the world behind

*continued on page 12*

## Energy and Environmental Trends in China

Air Quality Facts	Air Quality Trends
<ul style="list-style-type: none"> <li>• 9 out of 10 most polluted cities in the world are in China</li> <li>• Respiratory disease is the number one cause of death in China</li> <li>• Mobile sources (3 out of 1000 people own a vehicle) contribute approximately 45-60% of NOx emissions and 85% of Carbon Monoxide emissions in China's urban areas</li> </ul>	<ul style="list-style-type: none"> <li>• Between 1995-2000, the Chinese government shut down 65,000 small heavily polluting factories</li> <li>• China's global share of carbon emissions decreased 8.8% between 1996-2000; today China is the 4th largest emitter of carbon dioxide in the world</li> <li>• In March 1997 the Chinese government mandated lead free gas by</li> </ul>



## Comparison of Environmental Quality Indicators in China and the United States

	China	United States
<b>A</b> Total carbon dioxide emissions (1999, million metric tons (mmt))[Emissions per capita, mmt] <sup>a</sup>	669 [0.5]	1,520 [5.6]
Total carbon dioxide emissions (1990-1999) as percentage of global total <sup>a</sup>	7.0	30.3
Percent change in CO <sub>2</sub> emissions 1996-2000 <sup>b</sup>	-8.8	+6.3
CO <sub>2</sub> emissions per capita (1996, kg) <sup>a</sup>	2,729	19,674
Annual use of ozone depleting substances (odp) (1998, production data, 000mt odp) <sup>c</sup>	98	32
<b>B</b> Percentage of total threatened mammal species <sup>a</sup>	18.7	8.0
Percentage of land in Protected Areas (1999) <sup>a</sup>	6.2*	13.1
Percent change in natural [plantation] forest area between 1990 and 1995 <sup>a</sup>	-0.48 [-7.97]	0.28† [n/a]
Total per capita energy consumption (kg oil equivalent, 1997) <sup>d</sup>	883	7,956
Total commercial energy use (1998, 000,000mmt)[Production, 000,000mmt] <sup>c</sup>	1,031 [1,020]	2,181 [1,695]
Emission of organic water pollutants (000kg per day)[000kg per day per worker] <sup>c</sup>	8,492 [0.14]	2,577 [0.15]

Sources:

<sup>a</sup> On-line database: *Earth trends: The environmental information portal at World Resources Institute*. (2001). www.wri.org

<sup>b</sup> Streets, David, G. et al. (2001). "Recent reductions in China's greenhouse gas emissions." *Science*, (294), (30 November), 1834-1837.

<sup>c</sup> Data from Prescott-Allen, R. (2001). *The wellbeing of nations: A country-by-country index of quality of life and the environment*. Washington: Island Press.

<sup>d</sup> UNDP, UNEP, World Bank, and World Resources Institute. (2000). *World resources 2000-2001 people and ecosystems: The fraying web of life*. Washington, DC: World Resources Institute.

<sup>e</sup> World Bank development indicator data. (2000). www.worldbank.org

\* China's State Statistical Bureau (SSB) records the protected land areas as constituting 8.8% of China's total land mass. See SSB. (2001). *China environment yearbook (Zhongguo Huanjing Nianjian)*. Beijing: SSB Publishing Office.

† Data for full forest area change in the United States.

*continued from page 10*

the United States). Projections indicate that China will consume approximately 14 to 16 percent of world energy by 2020.<sup>4</sup>

This fact is of particular importance given the composition of China's energy production. Around 70 percent of China's energy comes from coal (predominantly high sulfur content), approximately 23 percent from oil, 2 to 3 percent from natural gas, and the rest from a combination of hydropower, nuclear, renewable, and biomass energy sources (millions of peasants generate heat and cooking fuel by burning straw, wood, and cow dung).<sup>5</sup> Although the Chinese government seeks to diversify energy sources, especially by developing natural gas markets, China will remain dependent upon coal for the foreseeable future. This dependence, coupled with the low quality of much of the coal and the lack of widespread coal washing facilities and scrubbers at industrial facilities and power plants, has led to serious health problems and deterioration of China's air quality. Respiratory disease is a leading cause of death—researchers estimate 178,000 urban deaths and as many as 1 million total deaths a year were attributable to air pollution between 1990 and 1995—and most Chinese cities far exceed ambient air quality standards set by the World Health Organization.<sup>6</sup>

As the burning of coal releases carbon dioxide—a greenhouse gas that contributes to climate change—and other gases that lead to acid rain and other environmental problems,

China's energy consumption is also of concern to its neighbors and the rest of the international community.

The growth in China's energy supply over the past 20 years has been matched by considerable efforts and investments to improve energy efficiency. Although there are some disagreements among Chinese and Western analysts on the energy statistics,<sup>7</sup> it appears that China's energy demand may have grown at only half the pace of GDP—an unprecedented achievement for a developing country.<sup>8</sup> Nevertheless, Chinese industries are still much less energy efficient than those in developed countries, and total energy consumption will probably rise sharply for the foreseeable future. Chinese officials at the State Development Planning Commission (SDPC) predict that China's total primary energy consumption will quadruple by 2040.<sup>9</sup>

Energy demand also has been spurred by a surge in vehicle production and purchases over the last decade. As a result, vehicle emissions have replaced coal soot as the major source of air pollution in several major cities. In response, the government has mandated a rapid phase-out of leaded gasoline, imposed tighter emissions standards, and is encouraging greater spending on alternative fuels.<sup>10</sup> But rising incomes, modernization, and China's entry into WTO, which will result in reduced tariffs on auto imports and permit foreign auto manufacturers to provide financing, will s5(actur)1cTspur7it sng,pNr iB0( g)-29.9(r)29.9(o)39.

- Nearly 28 percent of China's landmass is denuded, the result of extensive logging and soil erosion; the area of land degraded, desertified, or salinized in China is expanding by 2 million hectares each year;<sup>14</sup>
- Some 90 percent of China's grasslands are degraded to varying degrees;
- Soil sampling on 300,000 hectares of farmland in protected areas revealed that approximately 12 percent were contaminated with heavy metals;<sup>15</sup>
- Haze from air pollution that blocks sunlight may be depressing China's farm yields by 5 to 30 percent;<sup>16</sup>
- 15 to 20 percent of China's wildlife species are under threat of extinction;<sup>17</sup> and,
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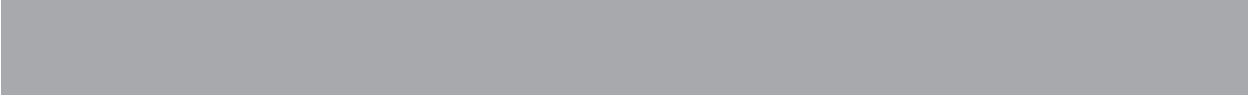












In order to meet the environmental objectives of the Tenth Five-Year Plan (FYP) the Chinese government will require investments totaling around \$85 billion. Some of the environmental and energy efficiency targets drawn up by SEPA and other







<sup>13</sup>Vermeer, Eduard B. (1998). "Industrial pollution in China and regional policies." Richard Louis Edmonds (Ed.), *Managing the Chinese environment*. (pp. 228-261)Oxford: Oxford University Press.  
Spitalnik, Ellen. (1996). "Getting a grip on solid waste." *The China Business Review*, (March-April), 36-40.

<sup>14</sup>See "China's Year 2000 state of the environment report" on the EST Section at U.S. Embassy in China Web site. [On-line]. Available: [www.usembassy-china.org.cn/english/sandt/index.html](http://www.usembassy-china.org.cn/english/sandt/index.html)

<sup>15</sup>See "China's year 2000 state of the environment report" on the EST Section at U.S. Embassy in China Web site. [On-line]. Available: [www.usembassy-china.org.cn/english/sandt/index.html](http://www.usembassy-china.org.cn/english/sandt/index.html)

<sup>16</sup>*Renewable energy development in China: The potential and the challenges.1*(2000). Zhang Zhengmin, Wang Qingyi, Zhuang Xing, Jan Hamarin, and Seth Baruch. Cvche0.0035.6(7 Tw[(Renew)15e(132(on the E

<sup>28</sup>Liu Changming. (1998). "Environmental issues and the south-north water transfer scheme." Richard Louis Edmonds (Ed.), *Managing the Chinese environment*. (pp. 174-186) Oxford: Oxford University Press; and The Economist. (2001). "Water in China: In deep." Volume 360, Number 8235, (August 18-24), 31.

<sup>29</sup>Kwan, Daniel. (2001, September 17). "Yangtze diversion impact studied: Officials assess effect on environment of ambitious scheme to transport fresh water to north." *South China Morning Post*.

<sup>30</sup>World Bank. (1997). *Clear water, blue skies*. Washington, DC: World Bank.



## Hindrances to Sino-U.S. Environmental and Energy Cooperation

Despite 20 years of bilateral energy and environmental collaboration and numerous protocols, U.S.-China cooperation in these areas has faced political and logistical obstacles on both sides that hamper the effectiveness of existing programs and limit the potential impact of future cooperation. *This cooperation could offset tensions in other parts of the Sino-U.S. relationship.* Moreover, closing the door to energy and environmental cooperation also could cause the United States to fall further behind other countries in promoting sales of energy-efficient and environmental technology and services to China. Below are specific factors in the United States that hinder bilateral environmental and energy cooperation with China.

### Obstacles in the United States

- *Statutory restrictions on development assistance to China:* While nearly 20 U.S. government agencies currently carry out some form of environmental or energy collaboration with Chinese counterparts, their work is supported completely by internal agency budgets and not formal development assistance. Statutory prohibitions prevent USAID environmental assistance and governance programs from operating in China (see Box 3). Most striking has been the inability of the U.S.-Asia Environmental Partnership (a USAID-affiliated institution) to work in China. U.S.-Asia Environmental Partnership (USAEP) is a public-private government program focused on Asia, but the fact it is not permitted to work in China clearly undermines its efforts to promote regional environmental and energy efforts as well as its capacity to promote sales of U.S. energy efficiency and environmental technologies in the fastest growing economy in Asia. The restrictions preventing USAEP from operating in China, however, are now not the only barrier to its China entry. In August 2001, budget constraints led the Department of Commerce's Foreign Commercial Service (FCS) to cut its partnership with USAEP. This loss of support resulted in the closure of USAEP offices in Hong Kong, Taiwan, and other areas in Asia. This move has further undermined U.S. credibility in the region and diminished support for sales of U.S. technologies. Even should Congress permit USAEP to operate in China, it is difficult to see how the program would operate without FCS financial support. For the past several years there have been legislative efforts in Congress to grant USAEP permission to operate in China, but they have never passed the House due to the concerns of various members over China's behavior in *non-environmental* areas.<sup>1</sup>
- *Lack of high-level support for international energy and environmental cooperation:* Without clear commitment by high-level officials in the administration and in Congress, U.S. government agencies will not risk devoting time and resources to bilateral work with China.
- *Low budgets:* Low and continuously shrinking budgets in U.S. government agencies for international energy and environmental activities hinder effective bilateral cooperation. The low budgets reflect the lack of priority by successive administrations as well as the often-hostile attitude of the Congress toward China.

## Statutory Restrictions to ODA for China

The **Fo eign A i t a n c e A c t** (which created the U.S. Agency for International Development—USAID), the **A m E o r t C o n t r o l A c t**, and annual **Fo eign A i d A u t o r i z a t i o n A c t** all contain restrictions linked to human rights and arms control violations that are (or could be) used to prohibit overseas development assistance (ODA) and economic support funds (ESF) to China (See Appendix B for list of statutory restrictions). Notably, previous administrations, for political reasons, have never stated formally that these restrictions apply directly to China. There exists, however, a de facto ban on formal development assistance and USAID operations in China. Currently, with the exception of some support for some nongovernmental organizations working on environmental, human rights, and health issues in Tibet, no ODA or ESF is given to China and the Department of State prohibits USAID from operating in China. The reasons for this prohibition are, not surprisingly, linked to the tensions and conflicts in U.S.-China relations. The ODA prohibitions close the door on what could be a key avenue for bilateral energy and environmental funding. Appendix B lists “notwithstanding clauses” in various acts that could create direct opportunities for narrowly defined aid and assistance to China or be used to open up targeted assistance programs to China.

- *Bureaucratic hindrances:* Extremely strict internal rules for dealing with foreigners, especially Chinese, hinder the activities of several government agencies, notably the Department of Energy and the Office of the Deputy Under Secretary of Defense (Installations and Environment) that works on environmental security. While these departments obviously must adopt strict security measures, excessive paperwork requirements may dim enthusiasm and willingness to engage Chinese counterparts.
- *Inadequate coordination among U.S. government agencies:* Environmental problems are inherently interconnected and demand cooperation among various agencies, even at the domestic level. The problem of insufficient coordination among agencies working in China was mitigated somewhat by the creation of the U.S.-China Forum on Environment and Development in 1997. Prior to this Forum, only ad hoc mechanisms for interagency coordination existed. While the Forum helped U.S. agencies learn about the work of other agencies, the lack of funding for Forum activities prevented it from reaching its full potential as a coordinating mechanism.
- *Inability of U.S. Export-Import Bank to offer competitive rates:* The U.S. Export-Import Bank (Ex-Im Bank) established a \$100 million Clean Energy Program in 1999 to finance U.S. exports of renewable energy and energy-efficient technologies to China, but has yet to disburse any of the funds. As Ex-Im Bank loans are offered at commercial rates, the bank has found it difficult to compete with concessionary rates offered by other countries. The Chinese, as well as many U.S. multinationals, also consider Ex-Im Bank to be more inflexible than its Japanese and European counterparts.

- *Insufficient support for U.S. energy efficiency and environmental technology companies:* The Department of State and the Department of Commerce's Foreign Commercial Service and Environmental Technologies Industries Office have devoted some staff in the embassy and consulates in China to bilateral environmental and energy cooperation. Only recently has the DoE stationed one individual in China to work on bilateral energy cooperation. However, Ex-Im Bank, EPA, and USAEP do not have staff on the ground in China who can develop connections with Chinese institutions and assist U.S. companies. The governments of Japan and the European Union devote significantly more resources and staff to exporting to China. Thus, even though American firms may have superior technology, they often find they have neither the financial resources to challenge competitors backed by their countries' tied aid programs nor consistent government support (this issue is discussed more fully in Part III).
- *Contentious nature of U.S.-China relations:* Political tensions between the United States and China cause many in U.S. government agencies to hesitate working with Chinese counterparts. This hesitancy is due to fears that such work could cause their agency to attract negative attention and a concomitant loss of funding, or simply because it is too difficult to get permission to work with Chinese counterparts.

## Obstacles in China

Political and economic factors on the Chinese side also act as hindrances to productive bilateral energy and environmental collaboration. Notably, some of these obstacles and political weaknesses represent areas in which U.S. training and exchanges could help strengthen China's ability to protect its environment.

- *Low priority of environmental protection:* Traditionally, the Chinese government has paid lip service to environmental protection and has not given this issue the priority it deserves. A 2001 World Bank study stated that China should be spending much more in this area. Though the Chinese leadership and public are beginning to realize the importance of environmental protection work, the government must clearly prioritize environment and sustainable development activities and grant appropriate status and funding. Equal attention needs to be paid to environmental protection at the provincial and local levels. The United States might be more willing to collaborate with China in the environmental and energy efficiency spheres if the Chinese government showed greater commitment to environmental protection.
- *Bureaucratic competition:* Internal competition among Chinese agencies to manage natural resources and energy policy not only hinders domestic programs, but also limits the effectiveness of U.S.-China bilateral initiatives. For example, sometimes the Chinese government has difficulty selecting which agency will lead on bilateral environmental or energy initiatives. Once selected, the lead agency in a bilateral agreement often will not

“share” the resources and planning responsibilities with other Chinese agencies, to the frustration of the U.S. agency partners. This intergovernmental competition within China creates a disincentive to bilateral cooperation.

- *Weak environmental agencies:* Although China’s main environmental agency (SEPA) has been raised to the ministerial level, it remains understaffed and under funded. Local government leaders often ignore lower-level Environmental Protection Bureaus (EPBs). Similar to EPBs, natural resource management agencies at the local level (such as water and forestry bureaus) also face challenges of getting resources and political support. The Ministry of Science and Technology (MOST), which conducts research on new technologies and helps fund scientific initiatives, is another major agency working on environmental issues. MOST is a much stronger agency than SEPA, but still must compete with other agencies for resources.
- *Continuing reforms and government reorganization:* Constant reforms and periodic reorganization of Chinese government agencies result in U.S. agencies “losing” their counterpart agency or having to deal with staff changes that might negatively impact cooperation.
- *Devolution of economic and fiscal authority:* The implementation of environmental policies in China has been complicated by the devolution of economic and fiscal authority to lower-level governments, some of which lack the understanding, resources, or desire to fully develop and implement environmental regulations or create mechanisms for fairly solving disputes over natural resources. Local governments not only receive less financial support from the central government than in the past but also are prohibited from offering their own debt instruments to finance environmental infrastructure—even though they increasingly bear the financial burden of providing such infrastructure. The number of potential Chinese partners (at both the central and local levels) for U.S. environmental and energy agencies far exceeds current U.S. spending levels. Notably, the lack of capacity at the local level to implement environmental policies indicates a promising area for Sino-U.S. city-to-city or province-to-state cooperative efforts.
- *Insufficient rule of law:* In the 1980s the Chinese government began to shift China’s economy from a command-economy to one dictated by markets and subject to the rule of law. Increasingly, the government has undertaken reforms to promote the rule of law throughout all segments of Chinese society. However, legal reforms and infrastructure are far from complete, creating problems for international cooperation. For example, without better contract and intellectual property rights protection, U.S. energy and environmental technology firms will be unwilling to transfer technology. The Chinese government has taken steps to

European Union, and is also a major recipient of multilateral finance. (See Part III for details) Not surprisingly, the Chinese government has come to rely on—and even to demand—concessionary financing from all developed countries. Ultimately, concessionary financing may not be the best way for China to strengthen its environmental protection and energy efficiency infrastructure, for such financing creates market distortions and does not always guarantee projects receive the best equipment and assistance. Demands for concessionary financing limit the ability of the United States to cooperate with China, since Ex-Im Bank can offer only commercial rates and the United States provides no official development assistance (ODA) to China.

- *Inexperience with market tools:* Among Chinese environmental and energy regulators there is a lack of experience and understanding on how to use market mechanisms as policy tools. Financial authorities, meanwhile, have little experience with environmental projects and are loathe to grant financial concessions (such as tax breaks). This lack of experience hinders effective implementation of bilateral projects that emphasize free-market mechanisms, such as emissions trading.

Some of the above statutory and institutional hindrances in the United States and China not only hinder bilateral governmental cooperation, but also act as barriers for U.S. companies wishing to break into the energy and environmental technology markets in China. The following section explores more fully the commercial opportunities and challenges for U.S. companies. ■

<sup>1</sup>The most recent Congressional attempt to support USAEP in China was the Foreign Operations, Export Financing, and Related Programs Appropriations Act (Senate—Amendment number 3511, June 21, 2000). This amendment was sponsored by Senators Baucus and Roberts and aimed to permit appropriated funds for USAEP—to be used for environmental projects in the PRC. The goal would be to enable the U.S. government to help U.S. businesses connect with provilor





- *Natural gas:* Chinese planners hope that natural gas will account for at least 10 percent of commercial energy consumption by 2020, up from 2-3 percent at present. Considerable investment will be needed to identify domestic resources, build transport and distribution infrastructure, and to create natural gas markets. Major cities along the coast are converting industrial boilers from coal to gas, along with residential heating and cooking facilities.<sup>4</sup>
- *Vehicle and gasoline-related pollution controls:* Euro 1 vehicle emissions standards have been adopted in Beijing, Shanghai, and Guangzhou and are to be implemented nationally by 2003.<sup>5</sup> These standards require vehicles to possess fuel injection systems and emissions-control equipment. Though implementation of these standards currently is uneven, large cities in China are purchasing new fleets of buses and taxis to meet the standards. The standards require that existing vehicles must be retrofitted with the requisite equipment or face being scrapped. The U.S. Foreign Commercial Service in Beijing estimated the market last year for imported emission-control technologies at \$270 million. Many Chinese cities are introducing vehicles powered by alternative fuels such as liquefied petroleum gas, compressed natural gas, electricity, propane, or a combination thereof, yielding opportunities in all of these technologies for U.S. firms, as well as downstream applications (such as filling stations). The Chinese government also adopted national unleaded gasoline standards in July 2000; however, Chinese refineries cannot yet meet these auto emissions controls standards. Such problems present foreign firms with opportunities to export higher-quality gasoline or help upgrade Chinese refineries.
- *Energy efficiency equipment:* According to Li Rongrong, Minister of the State Economic and Trade Commission (SETC), the Chinese government aims to decrease its energy consumption from 2.77 tons of standard coal per 10,000 Yuan of gross domestic product in 2000 to 2.2 tons by 2005.<sup>6</sup> According to China's State Development Planning Commission (SDPC), key technologies ripe for energy efficiency renovation projects include industrial boilers, steam pipe networks, motors, industrial kilns, buildings (particularly heat systems), and lighting systems.

### **Challenges to U.S. Participation in China's Energy and Environmental Markets**

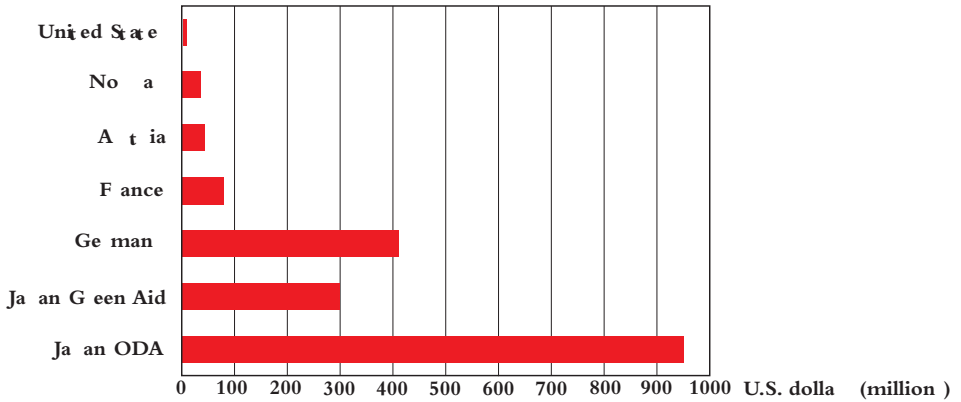
Despite China's great need for investment in energy efficient and environmentally friendly technologies, foreign firms, including those from the United States, face a number of significant obstacles when pursuing sales and investments in China. These stem from unrealistic tariffs and low rates of return, lack of hard currency, Chinese protectionism, inadequate protection of intellectual property, non-transparent and fragmented regulatory bureaucracies, and lack of policy support.

On top of all these constraints China lacks well-developed financial mechanisms critical to reducing risk and generating investment funds. Financing constraints are perhaps the



preventing U.S. firms from tapping OPIC guaranties and project finance for China projects. The sanctions also bar OPIC-invested funds, such as Aqua International Partners, L.P. and the Global Environment Emerging Markets Fund—which focus on the water and clean energy/water sectors, respectively—from investing and profiting in China.

**Figure 2. Environmental Aid to China (1993-1997)**



Source: Information compiled by Peter Evans from OECD CRS database and donor budget documents and presented by Peter Evans at “Japan-U.S. Environmental Cooperation: Promoting Sustainable Development in China.” Conference held at the Woodrow Wilson Center 21 November 2001. The Japanese ODA cited in this figure is the portion of overall ODA that supported environmental projects in China.

**U. S. J E A C**

Bilateral assistance to China basically follows the pattern of overall ODA flows, with Japan far and away the largest bilateral donor to China’s environmental sector. Under Japan’s Green Aid Plan, the Japanese government set up 30 projects to demonstrate clean coal and energy efficient technologies between 1993 and 1998. The total value of these projects was \$352.7 million—nearly the same amount as the entire Montreal Protocol mechanism. Additional funding was made available via Japan’s Bank of International Cooperation (JBIC). Though most JBIC projects are untied, many environmental projects are deemed commercially nonviable and thereby qualify for exceptionally low rates and long payback periods (.75 percent over 40 years). These projects generally are limited to Japanese firms.

European countries, led by Germany and France, provided \$697.1 million to environmental aid projects in China from 1993 to 1997. Australia and Canada provided another \$50.8 million. (See Table 3) The bulk of bilateral assistance from Japan, Europe, Canada, and Australia went to water supply and sanitation projects. The next largest sectoral recipient was for cleaner energy and energy efficiency projects. The U.S. Trade and Development Agency (TDA) provided \$24 million to U.S. companies for feasibility studies and training activities in China from 1981 until 1989, but TDA was prohibited from operating in China from 1989 until 2001. TDA has now resumed operations in China, and will likely spend a few million dollars in China this year. Other U.S. agencies committed around \$2 million to environment-related services between 1993 and 1997. Much of this funding went to U.S. organizations to pay for the cost of workshops and technical assistance focusing on regulatory and market reforms, rather than technology transfer. Currently, almost all U.S. funding for programs in China comes from departmental budgets, not specific funds

appropriated for work in China. The two small exceptions include congressional funding for environmental and civil society work in Tibet (which goes to a U.S.-based NGO) and support for the American Bar Association to set up an environmental governance training program.

The U.S. Ex-Im Bank established a \$100 million clean energy facility in 1999 to finance U.S. exports of renewable energy and energy-efficient technologies, but has yet to disburse any of the funds. As Ex-Im Bank loans are offered at commercial rates, the bank has found it difficult to compete with concessionary rates offered by other countries. Moreover, with

**T**he Chinese government's growing environmental awareness, increasing budgets for energy restructuring, and environmental infrastructure are good news for U.S. firms, the world leaders in these areas. A wide range of U.S. firms are engaged in trade and investment in China's energy and environmental areas, from large multinationals to small niche firms. The first to enter the Chinese market were the oil and gas companies. Virtually all of the major U.S. energy firms—including the ExxonMobil and TexacoChevron Corporations—are active in China, in both upstream and downstream operations. Their operations cover a spectrum of activities, from oil and gas exploration to filling stations to petrochemical production. U.S. firms such as the AES Corporation also have been active

## U.S. Businesses Find Success in China

*continued from page 37*

- Alliant Energy International, which has been active in China since 1996, has invested over \$30 million in cogeneration plants throughout China;
- U.S.-headquartered BP Solar won a contract to supply 100,000 watts peak of solar modules to the Ali Project Brightness Program in western Tibet;
- Aeromag Corporation has signed an order in principle to sell \$12.5 million worth of wind turbine technology to Chinese customers; and,
- CH2MHill is advising Chinese government officials on how to develop a “green Olympics” in 2008.

Despite these successful examples, U.S. firms generally lag behind European and Japanese competitors in key environmental markets in China. Their underperformance stems from financing constraints, corporate inflexibility, less government support (compared to many top competitors), and in some cases, lack of a true commitment to the Chinese market. Corporate commitment to China may grow, however, with the size of the potential market. According to market research firm AccessAsia, China’s market for environmental goods and services will nearly double over the course of the Tenth FYP, reaching around \$19 billion in 2005.

*Sources:* The World Bank Group in China: Facts and Figures, the World Bank Office Beijing, July 2001; ADB Market Brief, U.S. Commercial Liaison Office for the ADB, January 2001; and AccessAsia quote comes from *Business China*, April 23, 2001 (An EIU publication)



*continued from page 36*

China aims to reduce per capita grain consumption while raising the relative proportion of meat, eggs, milk, fish, and vegetables in the Chinese diet.<sup>10</sup> Overall, annual grain output would still need to rise by 14 percent to 570 million tons in 2010 to support such plans. While China's accession to WTO will likely result in greater grain imports as trade barriers come down and Chinese farmers switch production to more lucrative crops, significant increases in animal husbandry could exacerbate already serious water pollution and grassland degradation problems.

Foreign firms are likely to benefit from China's accession to WTO, as import tariffs will decline (average tariff rates on oil and gas equipment will drop by as much as 50 percent). Moreover, the Chinese government will be required to abide by international competitive bidding procedures, and policies that favor domestic production will be abolished. Foreign companies also will be able to distribute and service their own equipment, which may make their products more competitive. Foreign company technologies could help lessen the environmental impacts of some of China's most polluting and energy intensive industries, such as the production of leather, textiles, food and packaging, and pulp and paper.

China's entry into WTO should also ease many of the current barriers to the provision of environmental services, though the licensing approval process may not become any easier. China's environmental services commitments cover sewage services, solid waste disposal services, cleaning services for exhaust gases, noise abatement services, nature and landscape protection services, and other environmental protection services. Environmental monitoring and inspections are excluded. Foreign service suppliers will be able to provide environmental consultation services through cross-border delivery (no commercial establishment in China will be required).

China's WTO commitments should enhance the transparency of the country's legal regime, which should also help foreign energy and environmental firms. Increased transparency may also result in Beijing expanding initiatives aimed at increasing public participation in the adoption of environmental rules and policies. ■

- <sup>1</sup>The air pollution and wastewater treatment data available at: U.S. Embassy in Beijing. (2000). "Environmental objectives and investment requirements for China's 10th five-year plan." (November). On-line. [Available]: <http://www.usembassy-china.org.cn/english/sandt/>
- <sup>2</sup>U.S. Embassy in Beijing. (2001). "China's year 2000 'State of the environment' report." (June). [On-line]. Available: <http://www.usembassy-china.org.cn/english/sandt/>
- <sup>3</sup>Center for Resource Solutions. (2001). Renewable energy development in China: The potential and the challenges.
- <sup>4</sup>Data on natural gas and vehicle and gasoline related pollution controls drawn from: U.S.-China Business Council. (2000). Environmental trends and policies in China: Implications for foreign business. (March). Washington, DC.
- <sup>5</sup>Euro 1 standards are the auto emission standards that were required in the European Union in 1992.
- <sup>6</sup>"Zero energy growth by 2010." (2001). China Daily, (November 11).
- <sup>7</sup>Ministry of Foreign Affairs of Japan <http://www.mofa.go.jp/policy/other/bluebook/2000/II-3-b.html#2>
- <sup>8</sup>Japan's Annual ODA Report 1999. <http://www.mofa.go.jp/policy/oda/summary/1999>
- <sup>9</sup>One excellent analysis of the potential impact WTO could have on China's environment is: Ferris Jr., Richard J., Changhua Wu and John Barlow Weiner. (2000). "Environmental implications of China's accession to the WTO: Policy and law considerations." Bridges. (June 30). See also Richard J. Ferris Jr. and Hongjun Zhang. (Forthcoming in 2002). "The Challenges of Reforming an Environmental Legal Culture: Assessing the Status Quo and Looking at Post-WTO Admission Challenges for the People's Republic of China." Georgetown International Environmental Law Review.
- <sup>10</sup>See U.S. Embassy in Beijing's EST Update. (2001). December 28. [On-line]. Available <http://www.usembassy-china.org.cn/english/sandt/>

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government agencies to learn what other U.S. agencies were doing on energy and environmental issues, but the lack of funding prevented true interagency collaboration to take place. In short, funding shortages and political obstacles in the United States hindered the effectiveness of U.S. agencies participating in the Forum.

The U.S.-China Forum on Environment and Development has met three times since 1997, with the most recent meeting 11-12 January 2000 in Hawaii. Notably, high-level officials in China still support the continuation of the Forum. However, the Bush administration has given no indication—either to the Chinese or U.S. participants—of whether it will continue to participate in the Forum, leading most observers to conclude that the administration has no interest in its activities and that the Forum is now defunct. In the meantime, U.S. and Chinese government agencies are reverting back to ad hoc agency-to-agency activities, often with reduced budgets. Without attention or pressure







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Since the early 1990s, the Japanese government and scientific organizations in Northeast Asia, Europe, and North America have launched projects to better understand the nature of trans-regional air pollution emanating from Asia. The Japanese government initiated the creation of two regional environmental cooperative organizations: *Eco-Asia* (<http://www.ecoasia.org>) and the *East Asia Acid Rain Monitoring Network*





China is a country rich in biological diversity, but development and population pressures threaten many forests, rivers, grasslands, animal and plant species, and marine resources. One of the first Sino-U.S. agreements focused on conservation, which remains a much less sensitive topic than climate change for bilateral cooperation. In addition to U.S. agencies, an increasingly large number of U.S.-based NGOs also have set up conservation projects with local and central government agencies in China, as well as with Chinese NGOs.<sup>6</sup> The Chinese government actually has encouraged the development of Chinese environmental NGOs in the area of conservation and environmental education. Some U.S. government projects have worked with U.S.-based NGOs and Chinese research centers. In bilateral collaboration, the U.S. government could do more to assist China in fostering green civil society by integrating NGO and academic participation in Sino-U.S. projects. (See Box 7 on page 49)

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In early 2001 the Trade and Development Agency (TDA) reopened its grant assistance program to China. The TDA program in China pr9P TwTDA pr053 Tw[(co[(tqgTD)84.8(.9(elop

**W**hile the U.S. government has been inconsistent in its environmental and energy policy relations with China, over the past 10 years U.S.-based environmental and energy nongovernmental organizations (NGOs) have steadily expanded their activities and commitments in the Middle Kingdom. Unlike multilateral and bilateral aid organizations, which have significantly increased their environmental assistance to China over the past 20 years, most of these NGOs are not bringing in large investments and grants for the Chinese government or the domestic research and NGO communities.

A handful of environmental NGOs and foundations began operating in China in the mid-1980s, focusing on environmental education and conservation activities. Some of these early groups included the World Wildlife Fund, the Ford Foundation, W. Alton Jones Foundation, and the International Crane Foundation. In the late 1990s, a larger number of U.S.-based environmental NGOs, and grant-giving organizations such as the Energy Foundation, as well as research centers and universities ventured into energy and environmental collaborative work in China. This latter wave stemmed from both the greater openness of the Chinese political system and, perhaps more importantly, a belated recognition that China will have a profound impact on the global environment in the future.

Today there are nearly 60 U.S. environmental NGOs, foundations, and universities oper-

In addition to working with Chinese central government ministries, U.S. environmental NGOs increasingly are partnering with local government agencies, research centers, community groups, and Chinese NGOs. U.S. NGOs also partner with U.S. government agencies and research institutes in China. For example, the DoE and several national laboratories (particularly Lawrence Berkeley National Laboratory and National Renewable

*continued from page 48*

an *Environmental Protection Information Exchange Agreement*. Through these agreements defense agencies on both sides acknowledge the linkage between environmental protection and national security, as well as the role military organizations can play in situations of environmental catastrophes. Since the Chinese downing of the U.S. Navy surveillance plane in April 2001, collaborative work in the area of environmental security has been inactive, although some other types of DoD and Chinese military exchanges or visits are slowly resuming. ■

<sup>1</sup>Appendix A provides details on a number of these protocols and cooperative efforts. Moreover, an inventory of U.S. government environmental and energy projects in China can be found in the China Environment Series issues 3, 4, and 5 (2000, 2001, 2002), which is a publication of the Environmental Change and Security Project at the Woodrow Wilson Center in Washington, DC. [On-line]. Available: <http://ecsp.si.edu>

<sup>2</sup>The central purpose of the Water Resources Management Program is to create a common understanding of critical water problems faced by both countries and work together toward solutions.

<sup>3</sup>The mission areas for the U.S. Embassy and Consulates in China include: (1) Engage China to prevent, reduce and remedy environmental degradation; (2) Promote clean technology, including expanded bilateral scientific and technical cooperation in clean and renewable energy, air quality, water quality, and solid waste; (3) Expand opportunities for the U.S. private sector, promote commercialization of technology opportunities; and (4) Facilitate cooperation on good government and the role of nongovernmental institutions in civil society.

<sup>4</sup>National Research Council, Chinese Academy of Sciences, and Chinese Academy of Engineering. (2000). *Cooperation in the energy futures of China and the United States*. Washington, DC: National Academy Press.

<sup>5</sup>For example, the Beijing Energy Efficiency Center (BECon) was established in 1993 in cooperation with three organizations—Battelle, Lawrence Berkeley National Laboratory, and the World Wildlife Fund. Today, it has a fulltime staff of twelve professionals and many consultants. BECon is leading high-level projects for the World Bank and United Nations Development Programme, and has contributed to many world-class reports on China's energy options.

<sup>6</sup>For details on the breadth and depth of U.S. environmental NGOs undertaking work in China, see issues 3, 4, and 5 of the Woodrow Wilson Center's China Environment Series, available on the Web at <http://ecsp.si.edu/>

U.S.-China relations have resembled a roller coaster ride over the past 15 years, at times requiring leaders in both countries to expend considerable effort to keep this critical relationship from derailing. U.S. policies toward China often are shaped by the view that China is a threat, while the Chinese leadership has viewed the United States as hostile and determined to hold China back and hinder its development. In light of long-running disputes over security and human rights issues, it is not surprising that despite growing trade linkages, the U.S.-China relationship is tinged with mistrust. This continued mutual mistrust has hindered open and constructive Sino-U.S. dialogues. Given current geopolitical realities, it is in neither side's interest—and may be deleterious to anti-terrorism and Korean peninsula peace efforts—to maintain this tension. It is therefore critical for the United States and China to find areas in which they can expand, not contract, lines of communication and cooperation. Energy and environmental collaboration present ideal opportunities for such cooperation and to build confidence in the U.S.-China relationship.

Strengthening Sino-U.S. governmental energy and environmental cooperation also could promote collaboration on environmental agreements at the international level, bolster opportunities for U.S. energy and environmental technology firms and help prevent U.S. isolation from the rest of the international community on environmental issues.

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- *Bolster contacts between U.S. Congress and China's National People's Congress (NPC) on environmental issues through inter-parliamentary exchanges.* For example the House Committees on Resources and Energy and Commerce and the Senate Agriculture, Nutrition, and Forestry and Environment and Public Works Committees could meet with their counterparts in the NPC's Committee on Environmental Protection and Natural Resources Conservation.
- *Encourage the interaction of China's financial authorities with U.S. counterparts at the local and national levels.* This kind of exchange could enable Chinese financial authorities to learn how financial measures can be used to encourage energy efficiency and environmental protection without incurring massive debt.
- *Encourage environmental activities of U.S.-based NGOs, universities, and philanthropic organizations in China.* For example, the U.S. government/USAID/USAEP could provide small grants to NGOs to conduct training and exchanges. In the late 1990s, USAEP supported the Asia Foundation to give grants to help create an environmental NGO-Business Partnership network in South Asia, which could be a model for U.S. government NGO grants in China. The U.S. government also could encourage the Chinese government to make it easier for both domestic and international environmental NGOs to register and operate their organizations in China.
- *Hold interagency meetings* to redesign, fund, and reestablish the U.S.-China Forum on Environment and Development.
- *Encourage cooperation and training between legal professionals* specializing in environmental issues to bolster Chinese implementation of environmental laws and regulations (e.g., train judges, lawyers, businesspeople, and financial/insurance company people on liabilities).
- *Encourage Sino-U.S. city to city or province to state cooperative efforts* in the energy efficiency and environmental protection spheres.
- *Acknowledge the Chinese government's greater cooperation in regional and global environmental forums* such as APEC, UN, PBEC and urge the Chinese government to include Chinese NGOs in these regional meetings.
- *Raise environmental and energy cooperation at high-level meetings.* All Cabinet-level officials should include energy and/or environmental issues on their China agendas.
- *Improve budgetary funding for environmental cooperation.* For example, funds should be used for adding staff, for neither EPA, USAEP, nor USAID have staff in China, while DoE and Ex-Im Bank staffing in China has been sporadic, thus limiting in-house expertise in key U.S. agencies.
- *Continue to support rule of law assistance in environmental spheres in China.* For example, Title V, Subtitle B of the Permanent Normal Trade Relations Act (PNTR Act) provides a

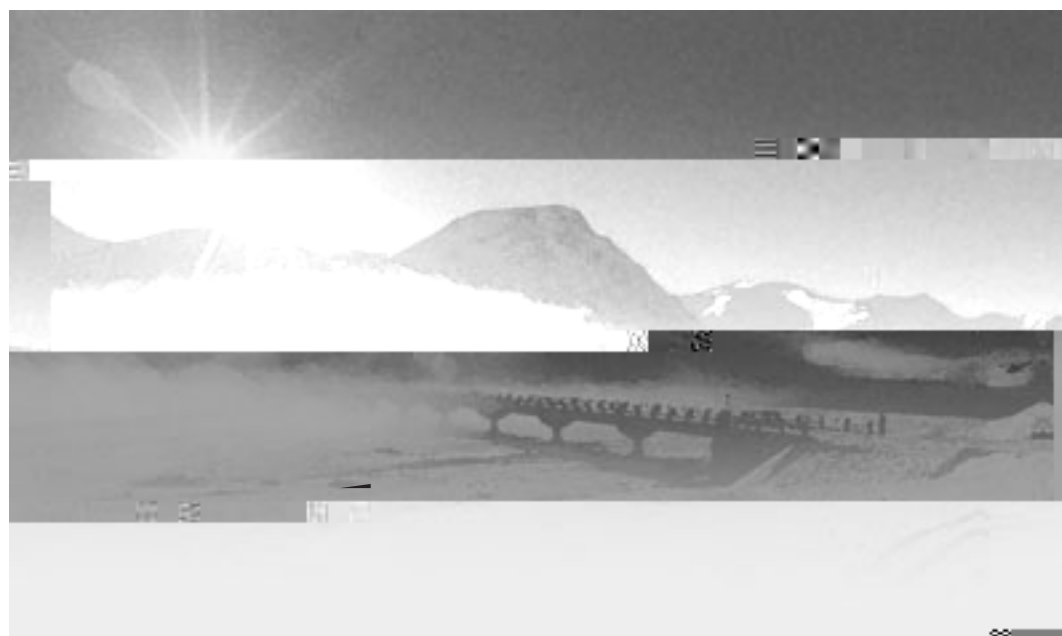




markets already. The earlier a firm gets into China to help set standards and forge strong relationships, the bigger the advantage. Breaking into the Chinese market is particularly important for U.S. firms, since they cannot rely on concessionary financing.

Eliminating barriers to environmental and energy collaboration in order to better assist China onto a sustainable development path is not simply of ecological and humanitarian importance, but also a potential opportunity for the United States to build better relations with the Chinese government. Initiatives that promote environmental collaboration could help to institutionalize new norms of cooperation and build peaceful bilateral government and trans-societal linkages between the United States and China. In other words, building opportunities for dialogue and environmental cooperation between the United States and China at the governmental and nongovernmental levels not only benefits the environment, but also can have positive side effects in the political, economic, and security arenas.

In light of the continued mutual mistrust between the United States and China, energy and environmental cooperation should become a priority of U.S. policy. Such cooperation ultimately is beneficial to the U.S. economy, good for the Chinese populace, and good for the globe. ■



## Energy Cooperation

*Protocol for Cooperation in the Fields of Energy Efficiency and Renewable Energy Technology Development and Utilization*—This protocol—signed in 1995 by the U.S. Department of Energy (DoE) and China’s State Science and Technology Commission—seeks to utilize and develop renewable energy and energy efficient technology that will help China meet and reduce its energy needs. The protocol contains seven annexes: (1) Rural Energy Development; (2) Wind Energy; (3) Energy Efficiency; (4) Renewable Energy Business Development; (5) Electric and Hybrid-Electric Vehicles Development; (6) Geothermal Production and Use; and (7) Renewable Energy Policy and Planning. A U.S.-China Energy Efficiency Steering Committee (co-chaired by DoE and the SDPC) coordinates DoE’s energy efficiency cooperation with China, which is conducted in ten priority areas including efficiency policy, efficient motor systems, and efficient buildings.

Five of the above annexes relate to renewable energy addressing policy, rural energy, large-scale wind systems, hybrid village power, renewable energy business development, and geothermal energy. There has been extensive cooperation in renewable energy including: (1) the installation of 200 solar home systems in rural areas; (2) renewable energy resource

natural gas production and imports in China. They are examining the environmental and health benefits of increased gas use, as well as the policies and programs needed to achieve the desired levels of natural gas use in China. The assessment—being conducted by EPA and China's State Environmental Protection Administration, SEPA) may identify opportunities for which credits certified under the Clean Development Mechanism could help finance natural gas projects in various sectors. In addition, the International Energy Agency in Paris, with support from DoE, is conducting a major assessment of China's natural gas sector.

*Protocol on Energy Information Exchange*—From 1995 to January 2000, DoE's Energy Information Administration (EIA) and China's National Bureau of Statistics (NBS)

*Global Climate Change and the U.S. Country Studies Program*—The United States has worked closely with China on climate change issues through the U.S. Country Studies Program (USCSP) in support of the United Nations Framework Convention on Climate Change. DoE provided financial support and technical assistance (approximately \$2 million) through USCSP for China’s first nationally integrated comprehensive country study dealing with issues and mitigation strategies in climate change. The China Country Study work (conducted from 1994 to 1998) was led by the Ministry of Science and Technology (formerly the State Science and Technology Commission) in cooperation with scientists and analysts from more than 12 ministries and institutions. USCSP also provided support to China on a Climate Change National Action Plan. The United States also is assisting China in developing socioeconomic modeling capabilities to facilitate China’s evaluations of climate change policy adaptations. Currently DoE is working with Tsinghua University, a major advisory source for the government on climate issues, to develop an energy technology systems analysis modeling framework. This framework will help China establish capabilities in analyzing the effects of climate change policy on the Chinese economy. It will also identify important technology opportunities for the mitigation of carbon emissions.

## **Agriculture, Natural Resource Management, and Biodiversity**

*U.S.-China Nature Conservation Protocol*—Signed in 1986, but repeatedly renewed and expanded, this protocol emphasizes wetland and ecosystem preservation. The activities under this protocol have facilitated joint studies and surveys of wildlife in China, as well as environmental education and biodiversity conservation and management training courses for Chinese foresters.

*U.S.-China Agreement on Agricultural Cooperation*—Instituted in 1999 and building on the previous 20 years of agricultural exchanges and research, this agreement encourages hi-tech agricultural research in both countries. Under this agreement, the U.S. Department of Agriculture (USDA) and China’s Ministry of Agriculture participate in numerous technical cooperation and assistance initiatives within two main areas listed below:

- (1) *Technical Cooperation and Scientific Exchange* encourages research institutes and agricultural operators and assists in high-tech agriculture (and food development) in the U.S. (Agriculture, 1999, p. 10674) and high-tech agriculture (and food development) in the U.S. (Agriculture, 1999, p. 10674)











activities. *(Editor's Note: Democracy assistance provided under this section to the Chinese government must go through the National Endowment for Democracy)*

8. **Section 538(b) of FY2000 of the FAP** authorizes the use of foreign assistance funds to support tropical forestry and biodiversity conservation programs. Subject to the regular notification procedures of the House and Senate Appropriations committees energy programs aimed at reducing greenhouse gas emissions may also be funded. This authority is not available, however, with respect to countries that are considered gross violators of human rights under sections 116 and 502B of the FAA.
9. **Section 451 of the FAA** allows for the provision of assistance to meet unexpected contingencies notwithstanding any other provision of law. This authority, however, is capped at \$25 million per fiscal year.

**Lee H. Hamilton, Director**

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