

SINOSPHERE

PROFESSIONAL ASSOCIATION FOR CHINA'S ENVIRONMENT

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Welcome to the first issue of Sinosphere

During the past two decades, China has experienced a rate of economic growth that is unprecedented in the history of humankind. Economic dynamism has lifted millions of people out of poverty, increased per capita incomes, and dramatically improved health indicators for the nation as a whole. However, development has come at a cost. China currently experiences pollution levels that are dangerously high, jeopardizing the lives of its citizens on a daily basis. According to the World Health Organization, suspended particulate and sulfur levels in the air above Chinese cities are among the highest in the world, contributing to a precipitous rise in the incidence of chronic obstructive pulmonary disease. In addition, over 80 percent of China's rivers are seriously polluted, and securing safe drinking water is increasingly difficult in both rural and urban areas. Meanwhile, acid rain and greenhouse gas emissions pose a significant threat to regional and global environmental well-being. Although the Chinese government has taken steps to address some of these environmental problems, much remains to be done.

In order to expedite environmental action, a group of concerned scholars established the Professional Association for China's Environment (PACE) in 1996. Based in Washington, DC, PACE is a non-profit, non-partisan organization that is currently recognized as a leading force in China's incipient environmental movement. The association's 450 members are located throughout Asia, North America, and Europe, and they represent a wide-variety of professional interests: academia (47%), the private sector (17%), governments and international organizations (17%), research institutes (13%), and non-governmental organizations (5%).

PACE is primarily concerned with coordinating the efforts of academics, business people, and policy makers to find realistic solutions to China's environmental problems. To this end, PACE has four main objectives:

- ◆ To disseminate information on China's environmental issues by publishing newsletters, journals, and books about environmental policy, environmental indicators, new research findings, and clean technologies
- ◆ To foster the exchange of information through academic conferences, seminars, and workshops
- ◆ To develop educational and technical training programs for Chinese policy makers and professionals in the public and private sectors
- ◆ To conduct research on China's environmental problems

If you are not yet a PACE member and would like to join, please visit our website and fill out the registration form.

We hope you enjoy our first issue!



*Contributing to a
better
environmental
future for China
and the world*

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Letters to the Editor

Environmental companies need reliable industry information

To the editors:

Unless they have extremely deep pockets, few companies would be brave enough to wander into the Chinese environmental market right now. This is a shame. North America's environmental industry comprises many small companies with special expertise. They are always interested in new business opportunities, and they often have the money to pursue mutually beneficial projects. However, they need reliable information about China's environmental industry from other business people, not from visiting bureaucratic representatives.

I am currently the vice-president of the China Canada Business Association in Calgary, and I have my own environmental consulting firm. The environmental market in China is confusing, and the situation is clouded by bureaucrats who like to boast of the industry's unlimited business opportunities. Unfortunately, their promises rarely materialize. For example, in the past six years, only two projects were successfully secured by Canadian firms, and both were CIDA funded.

I think PACE could draw a much bigger audience if it worked to supply reliable market information to its members, not just fostering research or technology exchange opportunities. PACE should feature more stories of successful joint projects with local private enterprises. That would encourage foreign firms to be

serious about the China market from a two-way trade standpoint.

THOMAS HA

Concrete environmental action needed

To the editors:

I really think PACE is doing a great job to raise awareness of the environment in China. A lot of work is necessary to obtain the support of the Chinese government. More important, however, are the practical steps that need to be taken to effect environmental change. Practical measures are more useful than conferences or academic studies.

Everyone is aware of the appalling environmental problems in China. What concrete things can PACE do to help the situation? How fast can it help to cleanup a river? How many trees can it help to plant? Do something really concrete. China does not need another organization. It needs more work, more money, and more concrete steps to make things happen!

ANONYMOUS

If you are interested in expressing your opinions about the information presented in SINOSPHERE, please send your comments to the editors at jpsnyder@umich.edu. We reserve the right to edit all submissions for length and clarity, and some letters may not be printed due to a shortage of space. All letters should include a name, occupation, and e-mail address.

SINOSPHERE

SINOSPHERE is produced for the Professional Association for China's Environment, a non-profit, non-partisan education and research organization whose primary purpose is to increase awareness of environmental problems in China. PACE also sponsors seminars, workshops, and conferences in the United States and China. For more information, please contact PACE's president, Hua WANG by e-mail at hwang1@worldbank.org.

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Environmental News Briefing

Social stability comes at a high environmental cost in Shanxi

Shanxi Province is running out of clean water. According to government statistics, over eight-seven percent of the province's twenty-four rivers are at least mildly polluted. Some of these rivers, such as the Fenhe which runs through the heart of the provincial capital in Taiyuan, are so polluted that their water cannot even be used for growing crops. Yet, sixty-four percent of the province's agricultural output comes from farmland that is fed by the Fenhe and its tributaries. Not surprisingly, polluted irrigation water is said to be responsible for a ten percent drop in crop production in Shanxi between 1993 and 1995.

In order to improve water quality, the provincial government has vowed to close fifty-four factories that line the banks of the Fenhe and dump an estimated 350 million tons of waste water and sewage into the river each year. It remains to be seen, however, whether the government will live up to its commitment. The provincial government has been unable to implement many of the environmental regulations it adopted three years ago because the steel mills that account for many of the most egregious violations are suffering from an economic slowdown that has rendered many of them virtually bankrupt. Closing polluting mills would undoubtedly contribute to local unemployment and could lead to social unrest – something the government fears far more than diminishing agricultural yields.

With that kind of threat looming overhead, it is no wonder that local officials are unwilling to shut down factories or collect fines.

It is unclear, however, how long pollution can remain unchecked in rivers like the Fenhe before local people begin to demand environmental and political change.

Environmental Concerns Given Priority During Clinton-Jiang Summit

During President Clinton's recent visit to China, environmental issues were a topic of discussion for policy makers on both sides. At a press conference held on June 27, President Clinton said that the U. S. and China were increasing their cooperation in a number of different areas, but "perhaps most important over the long run, we are committed to working together on clean energy to preserve our natural environment, a matter of urgent concern to both our nations."

Later the same day, National Security Advisor Sandy Berger said that he believed environmental cooperation between the two nations was "extremely important." He continued, "China, growing as fast as it is, will surpass the United States as the largest emitter of greenhouse gases in 10 or 15 years. We will now intensify substantially our cooperation on clean energy, with American technology, working with the Chinese, working on a nationwide air quality monitoring network, working on power projects and coal bed methane technologies, as well as having an energy finance conference so that we can talk about how China can finance an economic growth pattern that does not replicate the wasteful energy patterns of the developed countries in the postwar period."

For more on the summit, see Sandra Cornell's story on the following page.

SEPA and UN to launch joint projects

According to Chinese newspapers, China's State Environmental Protection Agency (SEPA) and the United Nations Development Program (UNDP) are implementing six projects that promise to reduce China's emissions of ozone depleting substances (ODS). Funding for the projects will come from the Multilateral Fund of the Montreal Protocol and is expected to total more than US \$7 million. This money will finance the cost of designing and fitting six factories with advanced production equipment that will help to reduce ODS emissions. The Chinese government predicts that ODS emissions from these six factories will decrease by approximately 1,490 tons annually, benefiting both the regional and global environment.

Guangzhou implements new environmental regulations

Chinese newspapers report that the city of Guangzhou has adopted several measures to improve environmental quality and awareness. According to Gan Haizhang, head of the local environmental protection bureau, the government will require 400,000 motorcyclists to install exhaust filtration equipment on their vehicles in an attempt to improve air quality in the city. The new regulation comes on the heels of air pollution regulations adopted last year, which resulted in a sixty-one percent reduction in the amount of airborne lead found in urban areas. In order to better monitor air pollution levels, the local environmental protection bureau has agreed to publish air quality reports on a daily basis. The new regulations also include provisions to prohibit the use of plastic bags in the city and to increase natural gas service to stores and residences.

A Good Week for China's Environment — President Clinton's Visit

By Sandra Cornell, Shanghai, People's Republic of China

Jin Hui neighborhood, a small suburb on the outskirts of Shanghai, received the word with only one week to spare: the President is coming! Almost overnight vacant lots strewn with rotting garbage, a stinking, inky black canal, and potholed, unglutted, flooded streets, vanished. The "leader of the free world" was paying a visit to the new Chinese middle class, and his hosts wanted everything environmentally correct.

With high-profile issues such as human rights, the trade deficit and Taiwan crowding the U.S. - China summit agenda, environmental concerns risked being sidelined during the Presidential visit. Fortunately this was not the case. The environmental impact of the President's visit to China was significant - and not just in Jin Hui.

The fourth stop on the President's nine-day visit to China, Guilin, was tagged as the place where he would deliver his environmental statement. Against a back-drop of spectacular mountains and capped by a scenic boat ride along the Li River, which was once heavily polluted but now rates as one of China's cleanest waterways, it was a perfect location. The day began with a meeting between President Clinton and a group of Chinese environmental specialists. The discussion covered a range of subjects including logging and deforestation, energy efficient housing, acid rain, domestic sewage, public education and environmental law enforcement.

"I believe that China has a unique opportunity because you're developing rapidly, but later in time than other countries, to avoid some of the terrible mistakes we made," the President said during the environmental roundtable discussion.

"Smog has caused entire Chinese cities to disappear from satellite photographs. And respiratory illness is China's number one health problem," he said later in the day in remarks to the people in Seven Star Park. "There are many who simply don't believe that anything can be done about it because they don't believe that you can grow an economy unless you use energy in the same way America and Europe have used it for the last 50 years -- more and more energy, more and more pollution to get more and more growth. But I disagree."

The idea that economic growth and development do not necessarily have to destroy the environment was a consistent theme that the President raised several times throughout the China trip with different audiences. In his address to students at Beijing University early in the week, the President talked about the dangers of global warming and told students of America's willingness to share clean energy technologies that would allow China to grow economically while improving the environment. He went on to ask the university community to work to convince political leaders that environmental measures would not "lead to large-scale unemployment or poverty."

In Shanghai on Wednesday the President breakfasted with a group of American business leaders during which he spoke strongly of the need for commercial interests to play a major role in supporting China's sustainable development. "'We have example after example of countries whose economies are doing well as they adopt more sensible environmental and energy practices, and companies in the United States who are making a significant share of their profits through conservation and the implementation of new technologies. We have to do something to break the idea in people's minds that the only way to grow the economy of a developing country is to adopt industrial age energy use patterns. It is not true ... and I ask you to lead the way,'" he urged to the applause of the business community.

At a roundtable discussion with Shanghai intellectuals the previous day the President predicted that the technological revolution taking place in China would enable the country to create an industrialized and a post-industrialized society at the same time. And here too, he raised the issue of China developing economically and protecting the environment at the same time. "America is the largest emitter of greenhouse gases, warming the climate. China will soon be larger than America," he said. "So we have this huge challenge— -- how to allow China to continue to grow ... and still not destroy the environment of the world. The scientists know this can be done. Scientists know we can grow the economy and improve the environment."

In addition to persuasive words in support of environmental protection, the President also brought some concrete assistance with him to China. The President's arrival along with the Secretary of Commerce, William Daley, was heralded in Beijing on Monday with the signing of commercial contracts between U.S. and Chinese interests including the US\$5 million sale of air-quality monitoring equipment by Dasibi Environmental Corporation, and the commitment from the U.S. Environmental Protection Agency to cooperate with China's State Environmental Protection Administration on urban air-quality monitoring.

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The idea that economic growth does not have to destroy the environment was a consistent theme during the President's visit

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A lifting of the ban on the export of U.S. advanced nuclear energy technology to China was also announced. According to official sources, the city of Shanghai, alone, consumed 39 million tons of coal last year and produced 524.9 billion cubic metres of waste air - figures which are increasing annually. Clean air technologies, such as nuclear powered electricity generation, offer the hope of slowing China's air quality deterioration and emission of greenhouse gases.

The President also announced that U.S. Ex-Im Bank financing will be made available to China in support of clean energy projects, and that the United States will host a meeting of the U.S. - China environmental forum, a sustainable development initiative launched last year by Vice President Gore.

Mark Brody, President of the U.S. China Environmental Fund, the only environmental NGO to establish a permanent office in China, commented in a letter to the Chinese press prior to the Presidential visit, "When East meets West to chart a course for superpower cooperation into the next millennium, discussions should carry us beyond the hurried pursuit of material gain, and focus on ideals that nurture the founding of a global community." Having raised concerns about China's pollution problems and the associated global implications, repeatedly throughout his visit to China, President Clinton has indeed done a service to the global community.

By promoting U.S. - China cooperation on environmental protection issues, and supporting environmentally friendly commercial projects, President Clinton has tried to have a long-term positive influence on China's pollution problems. An influence which will, hopefully, be felt more widely than just in the suburb of Jin Hui.

Sandra Cornell is a freelance journalist who lives and works in Shanghai, China.

Call for Contributions

To ensure the quality of SINO-SPHERE, the editorial staff needs contributions from you, our members. We hope to establish a backlog of pertinent articles that we can draw on from time to time over the next few months, but our success ultimately depends on your willingness to provide us with information. In general, we need three types of contributions:

ABSTRACTS

If you have written, published, or presented any articles that are relevant to the study of China's environment, please send us an abstract of the article and information on how we can obtain a copy (Publication date and location, or personal address). We would like to include these abstracts in our upcoming issues to inform our readers of the type of research that is being carried out by PACE members and to stimulate discussion about environmental issues.

ARTICLES

For those of you interested in specific issues, we would like you to express your views in short scholarly essays devoted to a single topic. We welcome articles on any subject, including technological developments, business trends, and policy issues. These articles should be approximately 2000 words in length, although quality is more important than quantity.

AUTOBIOGRAPHICAL SKETCHES

Please send us brief descriptions of your educational background, current occupation, research interests, and any specialized information regarding your involvement in issues related to China's environment. You should also include a current address and a contact number.

Remember that SINOSPHERE will be read by almost 500 people worldwide, many of whom occupy influential positions in the public and private sectors, academia, and NGOs. This is your chance to communicate with like-minded individuals who share your interest in China's environment and to tell them of your research and concerns. Please send all submissions to the editors at jpsnyder@umich.edu or feng@cert.ucr.edu

Shaping an Environmental Protection Regime for the New Century: China's Environmental Legal Framework*

By Zhang Hongjun and Richard Ferris, Jr.

* The first installment of a four-part series that discusses the state of environmental law in China.

Throughout modern history, China has placed little emphasis on the development of a comprehensive legal system for various philosophical, political, economic and cultural reasons. Since the late 1970s, however, law has acquired greater importance and become a considerable factor in the economic, political and social transformation of the country. The proven benefits of a stable legal system have not been ignored by China's leaders and the public-at-large. The development of China's various environmental regulatory regimes has played a prominent role in the evolution of the country's overall legal system and is increasingly seen as integral to China's future prosperity. China's well-publicized economic development boom is fueled, in large part, by the investment of an increasing number of foreign companies. The rapid pace of development in China, however, has been matched by equally swift administrative and regulatory changes that serve to confound the investment community. The authors hope that the information provided in this article will assist those interested in China's environmental protection regime understand the origins, current situation and future directions of these changes.

LAW MAKING INSTITUTIONS

The principal organs responsible for the enactment of laws and policy documents are identified in the Constitution.¹ The National People's Congress (NPC) is the highest-level legislative institution in China. The NPC has the power to enact and amend "fundamental" national statutes, such as the

Civil Law,² including statutes related to the establishment and organization of other government institutions. The NPC may also amend the Constitution via a procedure that requires a two-thirds majority of the legislators. The Standing Committee of the NPC is authorized to enact and amend all laws with the exception of those "fundamental laws" that may only be enacted by the NPC itself. During times when the NPC is not in session, the Standing Committee may supplement and amend laws enacted by the NPC only insofar as these supplements and amendments do not contravene the law's "fundamental principles."³ The State Council⁴ may enact administrative regulations in accordance with the Constitution and applicable law. The provincial people's congresses, the people's congresses of special municipalities (Beijing, Chongqing, Shanghai, and Tianjin), and the standing committees thereof, may enact local regulations provided they do not contravene the Constitution and applicable national laws and administrative regulations. Lastly, the people's congresses of national autonomous regions may enact autonomous region regulations and specific regulations, the latter covering more specific subject matter than the former.

NATIONAL ENVIRONMENTAL ADMINISTRATION

At the highest level are the NPC, the newly formed Environmental Protection and Natural Resources Conservation Committee, and the State Council, all of which serve advisory, as well as drafting and oversight roles with respect to environmental legislation and regulations. The NPC and the Standing Committee are also responsible for legislative matters related to international environmental agreements. As a newly established ministry-level entity, the State Environmental Protection Administration (SEPA) is responsible for formulating national environmental rules, methods and standards.⁵

Most important for those investing or contemplating investment in China, are the ministries under the State Council that wield significant influence on the implementation of environmental statutes and regulations enacted by the NPC and the State Council, respectively. Each industrial ministry has an environmental protection department, office, or

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“The development of China’s various environmental regulatory regimes has played a prominent role in the evolution of the country’s overall legal system.”

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division responsible for overseeing and issuing approvals for industrial operations and other foreign investment projects within their jurisdiction. The total number of specialized administrative entities changes frequently as the result of government restructuring initiatives.

In what may be China’s most significant restructuring initiative of this century, on March 6, 1998, the State Council formally announced plans to reform the country’s complex administrative structure. These plans are part of a far-reaching economic reform package. The reform plans were approved by a majority of the delegates to China’s Ninth People’s Congress on March 10, 1998. Among other things, the reform plans will require the closure of 11 of the country’s approximately 40 ministry-level entities. Many of the remaining entities will be reorganized. It is estimated that the resulting changes in the administrative landscape will precipitate a 50% reduction in the current number of administrative personnel. Most of the entities slated for closure or reorganization have environmental protection divisions or offices that influence environmental regulatory programs affecting industry sectors within their jurisdiction.

In the near term, these profound changes will likely detrimentally affect the efficiency and efficacy with which these programs are implemented. Administrative responsibilities of many of the closed ministries will be assumed by new bureaus under reorganized ministries. For example, administrative responsibilities of the Chemical Industry Ministry will be assumed by a new State Petroleum and Chemical Industry Bureau under the State Economic and Trade Commission, which will also take over administrative responsibilities once held by the China Petrochemical Corporation (Sinopec) and the China National Petroleum Corporation (CNPC). The closures, reorganizations and personnel reductions will likely be implemented among line agencies and subnational-level administrative entities as well.

LOCAL ENVIRONMENTAL ADMINISTRATION

At the local level, provincial environmental protection agencies, as well as county and municipal environmental protection bureaus (EPB), oversee compliance with national environmental statutes, regulations,

rules, methods, and standards, as well as local counterparts enacted by local people’s congresses and standing committees.

As discussed later in this article, local governments have been identified as the keys to the success of the country’s environmental protection programs. Former premier Li Peng and other senior government officials have admonished local officials for their apathy towards environmental protection.⁶ Because the results of industrialization severely impact the quality of life in China’s municipalities, it is likely that national government and citizen pressure to overcome this indifference will increase.

NATIONAL LEGISLATION⁷

Environmental Statutes. In 1979, the Standing Committee of the NPC enacted China’s first major environmental statute, the Environmental Protection Law (EPL).⁸ This law brought China’s environmental protection work under the aegis of the infant legal system and laid the foundation for future environmental legislation. Although far too lengthy to be summarized in detail in this article, the EPL essentially provides the general framework for allocating administrative responsibilities, identifies target areas for environmental protection and natural resources conservation work, specifies measures for the control of environmental pollution and other public hazards, and outlines legal liabilities for violations. The EPL is potentially applicable to all regulated entities, and thus should be consulted in conjunction with subsequent media-specific legislation. If a media-specific piece of environmental legislation does not address subject matter contained in the EPL, the relevant EPL provisions will apply by default. Since 1979, sixteen laws dealing with pollution control and natural resource conservation have been enacted by the NPC.

Environmental Regulations. At the next level of authority below the statutes are regulations issued by the State Council, which are generally more technical and specific. These are in fact “implementing legislation” setting forth legally binding requirements at a greater level of detail than is provided in the statutes themselves. The State Council has issued more than 20 regulations specifically addressing environmental protection and natural resource conservation since 1979.

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Examples are the Implementation Regulations for the Water Pollution Prevention and Control Law⁹ and the Provisional Regulations for Environmental Management in Economic Development Zones.¹⁰

*Environmental Rules, Methods, and Standards.*¹¹ In addition to the system of regulations, at still a lower level of authority, are the rules, methods, and standards documents formulated by SEPA, other ministries and agencies under the State Council. Broadly speaking, rules are more administrative, whereas methods are more technical in nature. Standards documents generally provide numerical bases for compliance that must be used in reference to regulations, rules, and methods. Without accompanying legislation, standards documents do not have any independent legal meaning. Rules and methods, however, prescribe conduct for the regulated community and have independent legal relevance. The terms “rules” and “methods” are often used interchangeably in Chinese environmental legislation. Foreign investors may be accustomed

LOCAL ENVIRONMENTAL REGULATIONS, RULES, METHODS, AND STANDARDS¹⁶

At the local level, the people’s congresses of provinces, autonomous regions, and special municipalities formulate local environmental protection regulations that must be based on national environmental statutes but can address the unique social and economic conditions of the localities.

Local EPBs, commissions, and sometimes offices are delegated the authority to enact rules, methods, and standards. SEPA’s general standards for environmental protection, quality, and pollutant emissions to be applied nationwide and to particular regions, serve as guidelines to local environmental protection administrations. Localities are allowed to set emission standards for pollutants not covered by the national laws, as well as to set more stringent standards for those pollutants already covered. Local standards must be forwarded to SEPA for review.

The local legal systems are playing an increasingly important and positive role in protecting and improving environmental quality, as localities are bearing the brunt of some of the country’s most severe environmental problems related to rapid development. These problems include increased contamination of agricultural water sources and noise control in urban areas. Important examples of local-level legislative activity include the enactment of legislation banning or mandating recycling of certain materials deemed “pollution intensive,” such as polystyrene foam, polyethylene or polypropylene packaging. In 1996 and 1997, such bans or recycling requirements were promulgated by many leading municipalities. China’s highly developed municipalities are also at the forefront of a national movement to ban leaded gasoline by the year 2000.

Along with increased legislative activity at the local level has come more investor confusion regarding national-local environmental requirements. Officially, the national legislation limits the legislative acts of local authorities. Local governments are authorized under Chinese law to pass more stringent environmental standards but may not enact more lenient standards. In reality, investment goals of local governments and other pressures may result in great variations

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Sixteen laws dealing with pollution control and natural resource conservation that have been enacted by the NPC since 1979

Environmental Protection Law	1979
Marine Environmental Protection Law	1983
Water Pollution Prevention and Control Law	1984
Grasslands Law	1985
Fisheries Law	1986
Mineral Resources Law	1986
Land Administration Law	1987
Air Pollution Prevention and Control Law	1988
Water Law	1988
Wildlife Protection Law	1989
Solid Waste Prevention Law	1996
Noise Pollution Control Law	1997
Water and Soil Conservation Law	1997
Energy Conservation Law	1998
Flood Prevention Law	1998
Forestry Law	1998

to using the terms “rules” and “regulations” interchangeably, while in China, according to the Provisional Regulations on the Procedure for the Enactment of Administrative Regulations,¹² normative legal documents issued by the State Council ministries and agencies may not be designated “regulations.” “Regulation” is a term reserved for the normative legal documents enacted by the State Council itself.

To date, well over 100 environmental rules and methods and 350 standards have been issued. Examples of rules, methods, and standards are the Management Methods for Environmental Impact Statements Pertaining to Construction Projects;¹³ the Rule on Reporting of Environmental Monitoring;¹⁴ and the Technical Standards for Groundwater.¹⁵

“... investment goals of local governments and other pressures may result in great variations between local and national environmental regulatory requirements..”

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between local and national environmental regulatory requirements. Such discrepancies continue to hamper efforts of regulators and foreign investors. These problems will likely be part of the price of China's rapid development for some time to come. Nevertheless, heightened national government scrutiny of local-level implementation, of at least the minimum standards imposed by national laws, can be expected as China moves forward with policies that favor economic growth while decreasing environmental degradation and resource depletion.

INTERNATIONAL ENVIRONMENTAL AGREEMENTS

China is a party to over 30 multilateral legal instruments affecting environmental protection, such as the Vienna Convention for the Protection of the Ozone Layer, the Montreal Protocol on Substances that Deplete the Ozone Layer, the International Convention for the Prevention of Pollution from Ships, the Convention for Prevention of Marine Pollution by Dumping of Wastes and Other Matter, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal and the Convention on International Trade in Endangered Species of Wild Fauna and Flora. As a result of participation in the United Nations Conference on Environment and Development in Rio de Janeiro, China signed the Conventions on Climate Change and Biological Diversity. According to the Chinese Constitution and relevant treaty law, and as specifically provided for by the EPL, if an international treaty regarding environmental protection signed or acceded to by the People's Republic of China contains provisions differing from those contained in national laws, the provisions of the international treaty shall apply, unless the provisions are ones as to which the People's Republic of China has announced reservations. As mentioned earlier, the NPC and the State Council have primary authority regarding accession and related policy concerning international environmental agreements. SEPA, as the highest-level environmental entity under the State Council, is authorized to accede to multilateral and bilateral environmental agreements on behalf of the People's Republic of China. For the most part, the impetus behind China's accession to these international instruments lies in the country's desire to become more fully integrated in the

world community, and to avail itself of the global support--financial and otherwise--that can then be accessed for critical domestic environmental projects and policies.

The next issue of SINOSPHERE will include the second part of this article, continuing the summary of China's environmental protection regime and addressing particular developments, as well as challenges, facing those charged with drafting and implementing the country's environmental laws.

Zhang Hongjun is Deputy Director of the Legal Department, Environmental Protection and Natural Resource Committee, National People's Congress of China. Richard Ferris, Jr., is an attorney with Beveridge and Diamond, P.C., where he specializes in international and Asian environmental law. This essay has been adapted from a longer article that was originally published in the Hong Kong University Asian Journal of Environmental Management.

Notes

1 See [Xianfa], Constitution, arts. 58, 62, 64, 67, 89, 100, 116 (People's Republic of China) (1982, as amended, 1988, 1993).

2 [Min Fa Tong Ze] (adopted Apr. 12, 1986, effective Jan. 1, 1987).

3 *Id.* art. 67 §3.

4 The State Council is the highest administrative organ of the People's Republic of China and the executive body of the NPC. Its functions and powers are listed in Article 89 of the Constitution, and include the power to adopt administrative measures, enact administrative rules and regulations, issue decisions in orders in accordance with the Constitution and other laws, submit legislative proposals to the NPC or its Standing Committee, and to oversee the work of the ministries and commissions. The State Council is composed of the Premier, the Vice-Premiers, the State Councillors, the Ministers in Charge of Commissions, the Auditor-General, and the Secretary General. It includes a special office in charge of legal issues--the Bureau of Legislative Affairs. The Bureau prepares the State Council's annual legislation drafting plan.

5 The National Environmental Protection Agency (NEPA), an administrative entity under the State Council, was elevated to ministry-level status and renamed the "State Environmental Protection Administration" ("SEPA") on March 27, 1998.

6 See e.g., *Chinese Premier Criticizes Law Pollution Control*, Agence France Presse (July 16, 1996) (reporting Li Peng's comment that much of China's deteriorating environmental situation was the result of local officials' "loose and inadequate" application of the laws).

7 Note that there are many significant sources of law in the Chinese legal system, such as Standing Commit-

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Western Influence on Environmental Management in China: Dreams of Markets and Democracy

By Jessica Hamburger

Western dreams for the reform of environmental management in China are ambitious and contentious. Conventional development organizations like the World Bank are aiming for a rational, scientific, market-driven system. Meanwhile, alternative development organizations like the Ford Foundation envision democratic decision making to achieve social equity, cultural preservation, and ecological sustainability. The ever-pragmatic Chinese government accepts funds from both types of groups, knowing full well that foreign dreams of markets and democracy, like those of domestic reformers and environmentalists, are doomed to shatter against the harsh reality of China's political and economic system. But the picture is not entirely gloomy. Change creates opportunity, and China today is nothing if not dynamic. An examination of three sample projects from each international development strategy, conventional and alternative, can illuminate their compatibility and conflicts with the political and economic system. This is a preliminary survey and too small to produce generalization about the effectiveness of specific strategies or tactics. However, the examples provided below may be of interest to practitioners interested in learning from the experiences of others in the field.

CONVENTIONAL STRATEGIES

Conventional strategies to improve environmental management in China usually promote of the use of economics. Typical approaches are financial cost/benefit analysis to justify in environmental investments, creation of self-financing authorities to provide environmental services, and environmental economic analysis to guide policy choices. Three cases of World Bank efforts to assist or influence Chinese government efforts to control pollution in urban areas reveal ways in which the political and economic system influence project results.

Cost/Benefit Analysis

A eutrophication control project for Lake Dianchi, in the city of Kunming, Yunnan Province showed how fragmented authority, lack of clear lines of authority, and conflict and lack of cooperation among institutions within the water resources management bureaucracy undermined the economic justification for the World Bank's loan. The Staff

Appraisal Report for the Yunnan Environment Project defined the main focus of the project as protecting the lake as a drinking water source. The Bank justified investment in control of nutrient inputs on the grounds that it would reduce algal blooms currently clogging water treatment plant works and defer the need to import water from other areas. By 1997, however, the local government had already decided to obtain clean drinking water supplies by diverting water from outside the Dianchi catchment, according to a Western consultant who helped prepare for the loan.

Further research would be needed to determine exactly why the contradiction emerged between the World Bank's justification and the provincial government's actions. Given the fragmented nature of decision making in China, it is entirely possible that different agencies were responsible for the contradictory investment decisions. The Yunnan Environmental Protection Bureau worked to attract World Bank funds for pollution control while the Yunnan Water Conservancy and Hydropower Bureau independently conducted feasibility studies of water import schemes. Since investment in environmental services is difficult to obtain, officials favoring environmental protection are likely to lobby for whatever investments they can get, regardless of their financial justification.

Creating a Self-Financing Environmental Utility

The struggle to design a plan for a self-financing trash utility in Kunming revealed the ability of city leaders to resist institutional change despite pressure from the provincial government to adopt market reforms.

The creation of an independent, self-financing trash disposal agency was

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“... foreign dreams of markets and democracy... are doomed to shatter against the harsh reality of China's political and economic system..”

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agreed upon by the World Bank and the Yunnan Provincial Government when the project was designed. The trash utility was to be financially independent, have financial statements, and operate without subsidy. By 1997, municipal officials had failed to make progress toward establishing an independent trash collection authority. A Western consultant to the municipality explained that many municipal officials opposed setting up an independent agency, and did not see why the World Bank cared about the institutional arrangements since repayment of the loan was guaranteed by the government.

Municipal opposition occurred despite the fact that the Yunnan Provincial Government has recognized the need to move toward full cost recovery for environmental services. Policy dialogue during preparation of the World Bank's Yunnan Environment Project led to adjustments of water supply tariffs, evidence of the provincial government commitment to economic reform of the environmental management system.

Environmental Economic Analysis

The favorable press reviews for a national study of the environmental costs of urban air pollution provided evidence of the central government's approval of public criticism of pollution, according to a report by the U.S. Embassy in Beijing. The study, entitled *Can the Environment Wait?*, was co-authored by Chinese and World Bank experts.

The central government recognizes that the political and economic system severely limits the ability of environmental protection agencies at all levels to carry out their mandates. To remedy this problem, the State Council has authorized the media, environmental organizations, environmental education programs, and environmental student movements to raise public awareness of environmental problems. The government's new openness has created an opportunity for environmental economic analysis to enter the policy debate, although its actual effect on decision making remains to be seen.

These cases suggest that some national and provincial level officials have adopted the economic principles of the conventional approach, but the ideas have not yet filtered down to the municipal level.

ALTERNATIVE STRATEGIES

Alternative strategies to reform environmental management in China often focus on increase the participation of local communities in decision making. Typical approaches are community participation in project selection, creation of revolving funds for micro-lending, and political activism. Three examples of the alternative strategy all deal with resource conflicts in poor areas. The third case is a Chinese-led environmental campaign that did not involve international development organizations, but is typical of Western approaches to influencing environmental management.

Community Participation in Project Selection

At Lugu Lake, on the Yunnan-Sichuan border, the government's decision to restrict local access to state forests limited the choices available to local communities regarding ways to reduce soil erosion. However, efforts to involve the community in choosing development projects emphasizing crop switching and tourism were supported by the government.

The failure of previous top-down reforestation efforts gave the Ford Foundation an opportunity to the push the government to work more closely with local communities at Lugu Lake, according to Jim Harkness, a program officer at the Ford Foundation in Beijing. This was accomplished by funding the Yunnan Academy of Social Sciences to train the local nature reserve staff in interviewing techniques to facilitate public involvement in project design, a methodology known as participatory rural appraisal.

Since the nature reserve staff would not allow the Yi to practice selective cutting in the state forest, the only feasible option was to use Ford Foundation funds to support efforts to help the Yi reduce erosion and increase their income on the land where they were living. The provincial forestry bureau was providing technical support for the project. These measures were compatible with provincial and county government goals to promote tourism in the area.

Creating Revolving Funds for Micro-Lending

At the Caohai Nature Reserve in Guizhou Province, a micro-lending community development scheme seemed to have reduced some of the tensions between farmers and na-

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ture reserve staff, but did not convince all of the farmers to stop draining wetlands in order to expand their fields.

Conflicts between farmers and the nature reserve erupted in 1991 when the reserve staff raised water levels to flood wetlands illegally reclaimed for farming. Efforts to resolve the conflict by funding activities combining poverty alleviation and ecological conservation began in 1992. The project has been a collaboration of five organizations—the Guizhou Province Environmental Protection Bureau; Caohai Nature Reserve; Rural Development Research Center of Kunming, China; International Crane Foundation of Wisconsin, USA; and Trickle Up Program of New York, USA.

The goal of the project is to provide small grants and loans to farmers to start businesses that do not degrade the local environment. User groups of farmers who have contributed part of their grants to community trust funds retain control over the money. Despite the financial support for new sustainable activities, many farmers continue to drain wetlands in order to expand their fields. It may be that the financial rewards of farming are sufficient to entice them to break the law, and they remain unconvinced by environmental education efforts. On the other hand, it may simply take more time and effort for the program to reach all the farmers.

Activism and Media Campaigns

A wildlife conservation campaign in Deqin County, Yunnan Province stopped clear-cutting in the habitat of the snub-nosed monkey. This case shows how the central government is encouraging citizens to put pressure on local agencies that fail to enforce environmental laws.

The campaign to save the snub-nosed monkey began with a letter to China State Environmental Protection Commission Chairman and State Councilor Song Jian from a young photographer in the Yunnan Province Forestry Bureau. The photographer, Xi Zhinong, appealed to Song Jian to stop the plan to cut 100 square kilometers of old growth forest in Deqin County in the Diqing Tibetan minority autonomous region of Yunnan Province. The county, one of the poorest in China, had decided to cut the forest in order to generate revenue, as it had not been able

to meet its payroll for several months. Song Jian ordered the Ministry of Forestry to investigate the matter and ensure that wildlife conservation laws were being enforced. As a result, the central government granted a subsidy to the county and the county canceled the clearcut, according to a report by the U.S. Embassy, Beijing.

The decision to stop the clearcut occurred while a group of student environmental activists were organizing a trip to Yunnan to investigate and expose the plight of the snub-nosed monkey. Their "Green Long March" received sympathetic coverage from the Chinese press and television.

These cases indicate that a support is growing for a limited form of community participation. County officials and nature reserve staff and the central government may not have adopted the democratic and social equity principles of the alternative approach, but they are willing to experiment with community participation that serves practical purposes.

CONCLUSIONS

Despite the difficulties encountered in project implementation and the seeming lack of ideological influence at the local level, western assistance organizations are making some impact on Chinese environmental policy. The Yunnan provincial government seems committed to economic reform of the environmental management system, even if compliance at the municipal level is limited. The Lugu Lake and Caohai projects have given provincial forestry and environmental protection bureaus experience in involving local communities in the selection of projects and the creation and operation of revolving loan funds for poverty alleviation and ecological conservation. The government's favorable reception of the air pollution study and the snub-nosed monkey campaign indicate that support for independent analysis, public activism and press coverage of environmental problems is growing.

Western efforts to reform environmental policy in China were initially described as ambitious. This analysis has revealed that the truly ambitious goal is to reform the political and economic system itself, the root of the limited effectiveness of many environmental ef-

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At the Roots

According to the Chinese government, 200,000 "mass organizations" are registered with the state. However, the true figure may be twice as high and growing rapidly. Among the most successful of these organizations are those that pursue goals that mesh with government policies — such as environmental groups.

SOURCE: Far Eastern Econ. Review, 5/7/98

**Western
organizations
are impacting
Chinese
environmental
policy**

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forts. That task can only be achieved from within China. Meanwhile, international assistance efforts can at least attempt in a small way to improve the efficiency of efforts to clean up the worst pollution, and increase the equity of attempts to alleviate poverty in the most ecologically rich communities.

Adapted from the author's Master's Thesis, Yale School of Forestry and Environmental Studies, 1998. Based on research on Chinese environmental management conducted last summer in Beijing and Yunnan and this year in the United States.

For more information, see these three articles on the U.S. Embassy website, <http://www.redfish.com/USEmbassy-China/sandt/>

Harris, J. 1998. *PRC Farmers as Stakeholders in Conservation: Community Development and Conservation at the Cao Hai Nature Preserve*. U.S. Embassy, Beijing. 1998. *The Fading of Chinese Environmental Secrecy*. U.S. Embassy, Beijing. 1996. *Saving the Snub Nosed Monkey*

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tee interpretations of the Constitution and fundamental laws and Supreme People's Court interpretations and decisions that are outside the scope of this environmental law primer. For a more in-depth discussion of the range of Chinese sources of law, see Albert H.Y. Chen, [An Introduction to the Legal System of the People's Republic of China](#) (Butterworths Asia 1994). For an excellent review of the challenges confronting the legal system in addressing China's environmental problems, see William P. Alford and Yuanyuan Shen, *Limits of the Law in Addressing China's Environmental Dilemma*, 16 STANFORD ENV'TL L. J. 125 (1997).

8 [Huan Jing Bao Hu Fa] (adopted "in principle" and promulgated for trial implementation on Sept. 13, 1979, abrogated by implementation of the Environmental Protection Law of 1989, effective Dec. 26, 1989).

9 [Shui Wu Ran Fang Zhi Fa Shi Xi] (adopted July 7, 1989, effective Sept. 1, 1989).

10 [Dui Wai Jing Ji Kai Fang Di Qu Huan Jing Guan Li Zhan Xing Gui Ding] (adopted Mar. 4, 1986, effective Mar. 15, 1986).

11 Although a detailed discussion of the nomenclature and relevance of Chinese normative legal documents is beyond the scope of this Article, the authors note that documents with English-language designations such as "orders," "directions," "decisions," "resolutions," "notices" and "circulars," may also be issued by State Council departments and local people's congresses. Significantly, however, these documents do not necessarily establish legal norms for the regulated community.

12 [Xing Zheng Fa Gui Zhi Ding Cheng Xu Zan Xing Tiao Li] (adopted Apr. 21, 1987, effective Apr. 21, 1987)

13 [Jian She Xiang Mu Huan Jing Guan Li Ban Fa] (adopted Mar. 26, 1986, effective Mar. 26, 1986) (governing the management of the environmental impact statement process).

14 [Huan Jing Jian Ce Bao Gao Zhi Du] (adopted February 21, 1991, effective February 21, 1991) (regulating the means by which local environmental monitoring stations submit reports to NEPA (now SEPA)).

15 [Di Xia Shui Zhi Liang Biao Jun] (GB/T 14848-93) (technical standards for groundwater quality).

Marketplace

A survey of business and technology trends

Waste Disposal Industry in China Characterized by Innovation

By Jonathan Sinton

Just became Assistant Manager for China with EHS Consultants, a recently acquired subsidiary of CH2M Hill, one of the largest international environmental and infrastructure consulting and engineering firms. EHS is based in Hong Kong, with an office in Beijing, and is spearheading CH2M Hill's development in China. We have carried out or are now carrying out projects in Mainland China, Hong Kong, and Taiwan in a wide variety of areas, including water supply and transfer, wastewater treatment, water planning, solid- and hazardous-waste disposal, landfill methane, environmental planning and regulation, environmental site assessment and auditing, and transportation.

Over the next few years, China will be challenged to maintain progress in mitigating problems of water availability and water pollution as development assistance for infrastructure and environmental projects peaks and starts to decline. China must build and effectively operate on an enormous scale new water treatment, wastewater treatment, solid-waste disposal, and air-pollution control facilities and equipment. Where will finance come from? What roles will domestic and international banks, other financial institutions, designers, contractors, and consultants play? What legal and institutional controls are key to raising the necessary funds, and to integrating enforcement of environmental regulations into the top priorities of all levels of government?

The answers to these questions are already emerging. They are found in the changing practices of development aid agencies and private-sector investors; in the insti-

tutional innovations being tried out in different localities in China; and in the way designers, builders, manufacturers and others in the private and non-government sectors are reorganizing and collaborating to provide their services. By working now on water, solid-waste, environmental-compliance, and other projects that are small or that have international funding, we are gaining experience in organizing the technical, financial, and organizational resources -- both domestic and international -- needed to make such projects happen on a larger scale, and in China's increasingly commercialized environment.

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Cleaner Production in China

By Jim Qin

We are all aware that current trends in the consumption of natural resources are unsustainable. Wastes and pollutants are released to the environment faster than the earth can absorb them, and natural resources are consumed faster than they can be restored. The need to reorient production processes, products, services and consumption demands is widely recognized as a priority on the sustainable development agenda.

Traditional thinking on environmental protection focuses on what to do with wastes and emissions after they have been created. The goal of cleaner production is to avoid generating pollution in the first place -- by increasing energy efficiency, cutting costs, reducing risks and identifying new opportunities.

Since 1989, the United Nations Environment Program (UNEP) has played a catalytic

“China will be challenged to maintain progress in mitigating problems of water availability and water pollution.”

“The goal of cleaner production is to avoid generating pollution in the first place.”

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role in establishing an international network for the promotion and implementation of cleaner production strategies. Cleaner production has been placed on the agenda of many governments, development banks, companies, universities, and international agencies. As a result, general awareness of the need for cleaner production has spread. Meanwhile, the capacity for conducting cleaner production assessments has increased, and the collection and dissemination of information on cleaner production experiences have been undertaken.

WHAT IS CLEANER PRODUCTION?

We are all familiar with terms such as pollution prevention, waste minimization, energy efficiency, and changes in consumption behavior. But what exactly is cleaner production? Cleaner production is a combination of all of the above. UNEP defines cleaner production as the continuous application of an integrated preventive environmental strategy applied to processes, products, and services that increase eco-efficiency and reduce risks to humans and the environment. This includes incorporating environmental concerns into the design process, conserving raw materials and energy, eliminating toxic raw materials, reducing the quantity and toxicity of all emissions and wastes, and reducing negative impacts along the life cycle of a product, from raw materials extraction to its ultimate disposal.

The prevention of pollution at its source reduces the cost of inputs, as well as the cost and liability of waste treatment and disposal. The systematic avoidance of wastes and pollutants increases the efficiency with which goods and services are produced and improves product quality. It also reduces risks to humans and their environment.

Cleaner production can be achieved through the continuous application of an integrated, preventative strategy applied to processes, products and services. This involves modifying products, services, or production equipment, substituting input materials or production technologies, refining process controls by improving operations, and amending maintenance practices and/or on-site recycling or re-use. The cleaner production strategy is therefore one of win-win outcomes

which provides attractive economies as well as environmental benefits.

CLEANER PRODUCTION IN CHINA

The concept of cleaner production was officially introduced in China at the 2nd National Conference on Industrial Pollution Prevention and Control organized by SEPA and the State Economy and Trade Commission (SETC) in 1993. The World Bank launched a project entitled “Improving Cleaner Production in China” in the same year. At that time, an environmental technical assistance loan was granted to the National Environmental Protection Agency of China (NEPA), now known as the State Environmental Protection Administration of China (SEPA). The project included 29 cleaner production assessment demonstration projects in several industrial sectors in Beijing, Shanghai, Tianjin, Shanxi, Liaoning, Gansu, Heilongjiang, Yunnan and Guizhou.

The World Bank project hastened the arrival of various cleaner production activities in China. For example, the China National Cleaner Production Center (CNCPC) was established in 1995 as a direct result of World Bank initiatives. The goals of the CNCPC are to establish a cleaner production information network, to provide personnel training and technical consultation assistance, and to evaluate and disseminate cleaner production technologies. The Center staff is involved in various assessment projects, and cleaner production auditing and training materials have also been developed and pilot tested.

The results of the pilot projects demonstrated that cleaner production not only reduces pollution and consumption but can achieve significant economic savings as well. For example, the overall simple pay back time for prevention measures adopted by participating plants generally averaged less than one year, and some low or no capital cost measures were found to be effective in achieving cleaner production goals. In addition, the cleaner production projects were found to be most effective when plant management integrated cleaner production concepts into planning and designing process. Overall, the pilot projects increased awareness of the concept of

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cleaner production and its benefit for plants' environmental image and increased competitiveness of their products in the international market place.

Bilateral aid programs have also played a catalytic role in promoting cleaner production in China. Some noteworthy examples of international joint projects are listed below:

China - Canada Cooperation. The SETC and NEPA have been implementing a cooperative project on cleaner production with the Canadian Government that involves formulating policies and regulations for promoting cleaner production, developing plans and guidelines for cleaner production, implementing outreach and educational activities, and establishing a cleaner production information system.

China - U.S. Cooperation. The NEPA and the Illinois Environmental Protection Agency jointly evaluated the cleaner production technology market for several industrial groups in China. The SEPA, the United States EPA, and the Air and Waste Management Association (AWMA) have been working together to host a series of cleaner production workshops. The objectives of the workshops are to promote cleaner production in China and to foster new ideas on cleaner production implementation.

China - Norway Cooperation. Through the World Cleaner Production Society, the Norwegian Government has provided training to Beijing Environmental Protection Bureau (BEPB) on cleaner production and has helped BEPB to establish up cleaner production demonstration projects.

China - Australia Cooperation. The China and Australia Cleaner Production Workshop was held in June 1996. Australia subsequently proposed to support some cleaner production study projects in China.

Since 1993, over 140 training workshops have been held in China, and nearly 10,000 people have participated in training sessions. Approximately 70 professionals have obtained certificates as qualified cleaner production assessment auditors, and a series of cleaner production audit and

training materials has been developed. In addition, thirteen provincial, local, and enterprise-level cleaner production centers have been established thus far, and seven provinces are in the process to establishing their own cleaner production facilities.

In sum, there has been a tremendous amount of activity devoted to cleaner production in China. Most of the progress achieved thus far has been limited to developing pilot studies, designing demonstration projects, and building general awareness among environmental authorities of the need for cleaner production in China. Less progress has been made in implementing effective cleaner production policies and creating a demand for cleaner production. In addition, cleaner production strategies have yet to be integrated into the design and installation of new industrial facilities. Tremendous challenges and opportunities still await the benefits of cleaner production concepts.

CLEANER PRODUCTION & ISO 14000

Pollution prevention has been a hot topic in the 1990s, especially since the the ISO 14001 standard was officially released in 1996. Cleaner production is not specifically mentioned in the ISO 14001 standard. In order to be certified, however, a company must incorporate a "pollution prevention" approach into its EMS. A cleaner production assessment is one of the key tools a company can utilize to evaluate its current situation and to identify where opportunities for improvement exist. This is not the same thing as an EMS audit. However, cleaner production targets can be read implicitly into EMS requirements for continuous improvement, and by striving for sustainable development, an EMS can provide a framework to ensure the incorporation of cleaner production initiatives. As a result, cleaner production and EMS should be seen as crucial elements in pollution control that mutually reinforce improvements in industrial environmental performance.

CHALLENGES AHEAD

Cleaner production concepts are relative new, and the implementation of cleaner production in China is still in its

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“The implementation of cleaner production in China is still in its infancy.”

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infancy. As a result, cleaner production requires changing attitudes, responsible environmental management, and a realistic evaluation of process and technology options. In spite of its many successes, cleaner production is not yet an integral part of public and private sector environmental strategies -- not just in China but all around the world. The challenges ahead for implementing a cleaner production regime in China are huge, but significant progress has been made since 1993. Some remaining challenges are:

- ◆ **Public awareness.** The general public, policy makers, and professionals are not fully aware of the concept and benefits of cleaner production.
- ◆ **Management support.** To successfully implement cleaner production, the support and involvement of factories is crucial.
- ◆ **Policies and regulations.** Cleaner production concepts have not been integrated and promoted enough in current policies and regulations, which still focus on “end-of-pipe” controls. During the pollution discharge permit review process, cleaner production is not even one of the evaluation criteria.
- ◆ **Lack of financial resources.** Large scale cleaner production projects typically require changes of process equipment and/or new technology. Lack of funding could be an important factor during cleaner production implementation.
- ◆ **Technology.** Research and development of new technologies are very important for implementing cleaner production. More innovative technologies are needed.

Cleaner production can be one of the most efficient ways to operate processes, manufacture products, and provide services. Through cleaner production, the cost of wastes, emissions, environmental degradation, and adverse health effects can be reduced, and benefits from these reductions can be realized.

If cleaner production is to become a universal guiding principle of sustainable development, there is a need to accelerate cleaner production implementation processes

and to engage new partners. In order to bring the discussion to a higher level, enlightened political and business leaders are making a concerted effort to draft an international declaration on cleaner production. This declaration is scheduled to be unveiled during the UNEP’s 5th International Seminar on Cleaner Production to be held in Seoul, Korea, this September. The goals of the declaration are to: 1) increase the commitment to preventative strategies by community leaders and the general public; 2) spread awareness of cleaner production among leaders in the public and private sectors; 3) increase the demand for cleaner production; 4) encourage local investments in substantive cleaner production activities; and 5) promote international cooperation on cleaner production initiatives.

High level officials from China’s SEPA will attend the workshop, and hopefully, their involvement will signal a new commitment to implementing cleaner production processes in China.

Jim Qin is a Senior Engineering Manager with Schreiber, Yonley, & Associates, an environmental consulting firm located in St. Louis, Missouri. He manages the Air Testing Division for the company.

Field Notes

Abstracts from recent research on China's environment

“China can afford to meet its burgeoning electric power needs without compromising environmental goals . . .”

China's Electric Power Options: An Analysis of Economic and Environmental Costs

By Battelle Memorial Institute, Beijing Energy Efficiency Center, and China's Energy Research Institute

China can afford to meet its burgeoning electric power needs without compromising environmental goals by applying new technologies and accelerating market reforms. Rapid economic growth over the past two decades has made China the fastest growing market for electric power in the world. Since 1990, the country has added the equivalent of one large power plant (600 MW) every two weeks. China's heavy reliance on coal to fuel most of these power needs, however, has caused extensive environmental damage. Sulfur dioxide emissions alone, the main precursor of acid rain, cause over \$13 billion of damage to the economy each year, erasing 2 percent of the country's gross national product.

Chinese planners and government officials have often placed economic growth ahead of environmental concerns. The researchers found, however, that when the full environmental costs of producing electricity are considered, the least-cost options justify greater use of flue gas desulfurization equipment, natural gas, and "clean coal" technologies. Furthermore, China should accelerate its research and development programs on fuel cells, gas and wind turbines, gasification processes, and other advanced power technologies to ensure that future energy and en-

vironmental goals will be met in the least-cost manner. By doing so, China could also become a leading exporter of these advanced technologies within two decades.

The researchers worked together for over a year on the project. They first estimated future power demand in seven regions of China and predicted that electric power demand will increase four-fold by 2020 from the 1995 level. The team then used an optimization model to determine the least-cost combination of generation technologies to meet future demand for each region, given a range of economic and environmental constraints. The model was also used to simulate the effects of command-and-control regulations (such as imposing limits on the amount of sulfur and carbon dioxide that a certain region may emit) and market-based policies (such as a sulfur dioxide tax). Results indicate that:

- ◆ Controlling sulfur emissions in southern China is cheaper than incurring the environmental and health damages they cause
- ◆ Natural gas can meet up to one-third of the country's future power needs for less total cost than using coal
- ◆ Nuclear power is not competitive with other generation technologies, even when capital costs decline by one-third
- ◆ China needs to accelerate research and development for new power technologies such as fuel cells, wind turbines, photovoltaics, and gasification processes
- ◆ Demand-side efficiency is often cheaper than adding new power supplies
- ◆ Wind power could compete with base load coal plants in some regions if China develops energy storage devices to raise power availability
- ◆ China's successful energy conservation efforts over the past two decades have reduced annual carbon dioxide emissions by up to 100 percent.

This report, funded in part by the W. Alton Jones Foundation, is available on the China web page of the Advanced International Studies Unit (<http://www.pnl.gov/china>). To order the report, contact Battelle at (202)646-7811.

Cleaner Production Demonstration Projects at Two Chinese Pharmaceutical Factories

By Katherine Kao Cushing and Leonard Ortolano

Civil and Environmental Engineering
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Adopting cleaner production measures provides manufacturing enterprises with opportunities to save money as well as reduce pollution. In addition, promoting enterprises to practice cleaner production serves to develop China's environmental protection industry by creating increased demand for related equipment and services. We analyzed cleaner production demonstration project audits implemented in two Chinese pharmaceutical factories as part of a project co-sponsored by China's National Environmental Protection Agency and the Illinois Environmental Protection Agency. Our research aimed to answer the following questions:

- ◆ How significant were the environmental and economic benefits resulting from the cleaner production audits?
- ◆ What factors influenced the audits' implementation?

Our data was gathered by interviewing key Chinese and U.S. government personnel, reviewing relevant documentation, surveying factory staff, and attending several of the project's conferences. The cleaner production audits themselves were implemented from January to October of 1996, but the larger project spanned from September 1995 to June of 1997.

Our data gathering took place from September 1995 to September 1997. Implementation of the cleaner production audits at both factories led to notable reductions in water pollution. The case factories implemented approximately half the options identified through the audits, reduced water consumption in targeted workshops by 20 and 30 percent, and reduced the amount of organic wastewater pollution (i.e.,

chemical oxygen demand) in targeted workshops by 22 and 40 percent.

The economic analyses conducted by the case factories was incomplete; consequently, we could not clearly determine the economic benefits. The lack of comprehensiveness in the economic analyses was surprising since it is commonly assumed that saving money is what motivates enterprises to implement options identified through cleaner production audits.

Although the opportunity to reduce pollution reduction and save money played some role in motivating factories to implement cleaner production options, other motivations were present because the audits were conducted as part of an international project. Based on interviews with key project personnel, the most important motivating factors for the case factories were the high degree of state-level oversight, the opportunity to learn about cleaner production methods and technologies used in the U.S., the prestige associated with working on an international project, and the opportunity to go to the U.S. on study tour.

This article will be presented at next year's International Conference on China's Environment, Technology, and Business in Beijing. To obtain a copy, please contact Katherine Kao Cushing by e-mail at: kat@leland.stanford.edu

Climate Change Policy - After Kyoto

By Craig Windram

University of Queensland

On 10 December 1997, at the third meeting of the Conference of the Parties in Kyoto Japan, a number of Annex I countries, committed themselves to targeted reductions in greenhouse gas emissions to be achieved by 2012. Non Annex I countries, led by the Chinese and Indian delegations, argued successfully for exclusion from binding emission reduction targets in accordance with the conditions of the Berlin Mandate.

“Implementation of the cleaner production audits at both factories led to notable reductions in water pollution.”

“China . . . will not be able to avoid participation in a global greenhouse abatement strategy in the longer term without putting the Agreement at significant risk of failure.”

The Kyoto Agreement marked the beginning of a new phase in climate change policy. However, despite its significance, many of the most contentious issues were left unresolved. In particular, the participation of developing nations in meeting global greenhouse reduction targets; the nature of the proposed economic instruments - tradeable permits, carbon credits and Joint Implementation - which are central to the cost effective reduction of greenhouse gas emissions in the longer term; and the means of monitoring and enforcing the Agreement within the international arena.

Almost one year on from Kyoto, and just prior to the fourth meeting of the Conference of the Parties, I explore briefly the progress - or lack thereof - made in the previous nine months, and I examine the status of the most vexatious issues left unresolved at Kyoto. I also speculate on the future direction of both domestic and international climate change policy and the implications for Chinese industries and the Government's negotiating stance.

Despite strong justification of the position taken at Kyoto by Non Annex I countries, many of the most significant greenhouse gas emitters, China included, will not be able to avoid participation in a global greenhouse abatement strategy in the longer term without putting the Agreement at significant risk of failure. As such, it is essential that Non Annex I countries begin to develop a programme and timetable for participation in such a scheme; one which is prepared on their own terms and takes account of the unique constraints they each face in balancing developmental and environmental priorities. I have outlined such an approach focusing on "no regrets" measures applicable to Non Annex I countries and the role which Joint Implementation might play in such a scenario.

Craig Windram is an independent environmental consultant who specialises in the fields of environmental economics, policy and ethics. He is presently at the University of Queensland conducting independent research into the potential impacts of alternative greenhouse reduction strategies on Australian industry sectors and international competition, and he sits on the Australian Coal Association's Greenhouse Policy Committee.

This article will be presented at next year's International Conference on China's Environment, Technology, and Business in

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“Climate change is one of the most serious environmental challenges facing the world today.”

PACE Progress

An update of ongoing activities and initiatives

Workshop on Climate Change and China

By Song Li and Rachel MacCleery

A Workshop on Climate Change and China took place on June 19, 1998 at the World Bank in Washington, DC. The event was organized by the Professional Association for China's Environment (PACE) and was cosponsored by the DC Bar Association. Around sixty representatives from non-governmental organizations, academia, private sector, World Bank, embassies, and US governmental agencies were in attendance.

In recent years, a consensus has emerged among scientists and policy makers that climate change is one of the most serious environmental challenges facing the world today. The Kyoto Protocol, signed in December 1997 at the third Conference of the Parties to the United Nations Framework Convention on Climate Change (FCCC), calls for reductions of anthropogenic greenhouse gas (GHG) emissions from industrialized countries. It is one important step in the world effort to reduce global emissions of the pollutants that may contribute to climate change. Important issues, however, remain to be resolved before Parties to the Convention on Climate Change meet in Buenos Aires in November of this year. The recent workshop on China and climate change aimed to analyze the considerations that China and other developing countries will face as negotiators hammer out the details of a climate change agreement, and to offer constructive suggestions to both Chinese and American decision makers for future actions. It was convened to facilitate the exchange of information and promote international cooperation around this complicated issue.

The workshop was chaired by Song Li of the World Bank's Global Environment Facility, and Hua Wang of the World Bank offered the opening comments. It included discussions led by Joseph Goffman of the Environmental Defense Fund, Alan Miller of the Global Environment Facility, Tom Richichi of Beverage and Diamond, PC, Eivind Tandberg of the World Bank's Carbon Offsets Unit, Ray Phillips of ICF Kaiser, Barbara Finamore of the Natural Resources Defense Council, Jian Xie of the World Bank, and Devra Davis of the World Resources Institute. The diverse range of expertise offered by panelists reflects the interdisciplinary nature of efforts to hammer out solutions to a complex and global problem.

The workshop was loosely organized around several topics, among them the potential for market-based cooperation among countries to significantly reduce the cost of emissions reductions. Recognizing the imperative of economic growth for the eradication of poverty and improvements in standards of living, the Kyoto Protocol does not establish binding limits for GHG emissions from developing countries. The Clean Development Mechanism (CDM), however, was established to facilitate cooperation between developing and developed countries in GHG emissions reductions. By giving value to investments in emissions reductions, the CDM allows countries in which GHG mitigation measures are expensive to undertake projects in countries where pollution abatement is less costly. For developed countries, the CDM means cost-effective mitigation options, sound investment potential, and the opportunity to invest abroad. Among the benefits of the CDM for developing countries are the accumulation of capital, transfer of clean, modern and efficient technologies, job creation, solution of local pollution problems and the accompanying health benefits, and wealth redistribution.

Despite this potential, many developing countries, including China, have expressed reservations about the CDM and other parts of the Kyoto Protocol. They have pointed out that developed countries, and in particular the United States, are the main emitters of CO₂ and other greenhouse gases. Although China's overall CO₂ emissions may eventually overtake the U.S., per capita emissions remain far lower, and were one-sixth the

Chinese efforts in the area of the environment are not widely known or appreciated in the U.S.

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average in OECD countries in 1992. In addition, damage to the environment from GHGs emitted from now developing countries, if measured in a historical or cumulative sense, won't begin to approach the damage wrought by industrialized nations until decades, or perhaps centuries, from now. Other concerns include fears that developed countries won't take their domestic emissions reductions obligations seriously, that developing countries may be treated unfairly in terms of targets and financial resource allocations, and that developed countries will use the CDM or other mechanisms to interfere in other countries' internal affairs. China is also worried that it will later face higher marginal costs of GHG reductions after the least expensive mitigation measures are taken by developed countries. Other barriers in China include institutional weakness and political distrust of the West.

Participants stressed that Chinese efforts in the area of the environment are not widely known or appreciated in the U.S. China is a signatory to the original FCCC signed in 1992, and the Chinese government has incorporated environmental protection and family planning into its national agenda. Studies of GHG emissions and sinks, national energy use projections, and a macroeconomic analysis of global warming and national response strategies are planned. Many sectoral standards for pollutants are already on the books, and are strengthened by the recently promulgated Energy Conservation Law. China has also made impressive improvements in energy efficiency, cutting energy intensity in half since 1978. If energy intensity were the same now as in the late 1970s, China would consume twice as much energy, and produce a much greater amount of pollutants, than it does currently.

Participants suggested that U.S. NGOs and government agencies emphasize the win-win potential for China and other developing countries in climate change efforts. Reduced emissions from fossil fuel combustion have important and immediate economic and public health benefits. Recent studies have suggested that air and water pollution cost China large portions of its GDP annually, and these percentages will continue to rise under a business as usual scenario. A World Bank study estimates that the health costs from a business as usual scenario in China will rise from \$32 billion in 1995 to nearly \$98 billion in 2020. The costs will include 600,000 premature deaths, 5.5 million cases of chronic

bronchitis, over 5 million restricted activity days, and 20 million cases of respiratory illness each year. Economic and health losses from pollution need not have such large impacts on China's long term growth and prosperity, if mitigating actions are taken now.

Despite progress in energy efficiency, there is still room for improvement. China remains one of the least energy efficient economies in the world and has unquestionable room for improvements in all sectors, and especially in energy intensive industrial processes such as steel production. It has been estimated that China could quadruple steel production with no increase in energy consumption if it utilized the newest technology. Recent World Bank and Battelle Pacific Northwest National Laboratory studies suggest that energy efficiency is the least cost method in the short term for reducing GHGs. Potential energy productivity gains, with the accompanying GHG emission reductions and economic benefits, suggests challenges, and opportunities, for China and developed nations.

Participants listed information dissemination and dialogue facilitation as important roles that U.S. agencies and NGOs can play in the climate change debate in China. Uneconomic and environmentally disadvantageous industrial and energy projects, such as a coke plant that utilizes 50 year old Japanese technology proposed for construction in Datong, China, are potential targets for international scrutiny and criticism. It was recommended that China's past contributions to GHG emissions reductions be amply recognized, and that China and other developing countries be viewed as allies, and not adversaries, in climate change mitigation efforts. Participants also urged China to remain an active participant in international climate change debates. Only sustained involvement in negotiations can help assure that China's concerns will be addressed, and that the structure of the CDM and other market mechanisms will be acceptable to it.

China, with vast and economically developed coastal areas, would be seriously affected by the rising sea levels that could be the result of global warming. China's food supply could also be threatened by changes in the climate system, and climate change could cost the Chinese economy billions of U.S. dollars per year. Acquiring advanced technologies, improving energy efficiency, and reducing local air pollution and GHG emissions are in China's national interest and are already part of national policy. Support for ac-

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tion on climate change is also present among the Chinese people. A recent poll taken recently by the International Environmental Monitor of Canada indicates that 56 percent of China's population wants major action now to mitigate the human impacts on climate, an increase of 24 percent from a similar 1997 poll. As the world prepares for negotiations in Buenos Aires, it is clear that increased dialogue, cooperation, and understanding between China and other countries can produce a climate change strategy that yields global benefits.

Upcoming Events

PACE has scheduled an **International Conference on China's Environment, Technology, and Business** to be held in Beijing, PRC, in the summer of 1999. The primary purpose of the conference is to provide a forum for policy makers, business leaders, investors, consulting firms, and NGOs to assess China's need for cleaner production technologies and the development of environmental industries. The conference will also investigate current trends in environmental policies and regulations. The conference will be hosted by China's National Environmental Protection Agency and co-hosted by the Environmental Protection and Resource Protection Committee of the National People's Congress of China. It will be sponsored by PACE and co-sponsored by the China Association of Environmental Protection Industries (CAEPI).

For more information, please visit PACE'S website.

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Member News

Jiang Dahe has just completed a stint as a lecturer in the Department of Mechanical Engineering at the University of Hong Kong. In July, he will return to his faculty position at the School of Environmental Engineering at Tongji University in Shanghai.

Jiang received his Ph.D at the City University of New York in 1984, where he specialized in fluid mechanics, specifically turbulent diffusion. At the end of 1984, he joined the faculty of Tongji University in Shanghai. For more practical teaching and research, he began to work on environmental engineering, atmospheric environment. His research focused on acid rain modeling, and he was a member of one of the first groups to study acid rain in China. He has since published a few papers in China Environmental Science (Chinese), and in Atmospheric Environment, a well-known international journal. In 1991-1992, he was one of ten local consultants involved in the NEPA-ADB program for Advanced Environmental Impact Assessment Training, and the next year, he spent four months in Japan researching acid rain modeling. When he returned to China, he began to apply GIS to environmental issues.

Since arriving in Hong Kong, he has been researching the application of GIS to atmospheric environmental problems. He recently attended GeoInformatics '98 in Beijing to present a paper on the application of GIS to wind field modeling. He will also attend the ASAAQ conference in Beijing in November entitled Atmospheric Science and its Application to Air Quality.

Ursina Boehm is currently a visiting scholar at the Centre of Asian Studies at the University of Hong Kong, where she will teach until the end of the year. Dr. Boehm hails from Germany, but she is very concerned in environmental issues and environmental management in China. She earned her first two degrees in business administration and electrical engineering from the Darmstadt University of Technology in 1996. She then transferred to the Research Institute for International Technical and Economic Cooperation (FIZ) at the Aachen University of Technology, where she received her Ph.D. She specializes in the environmental management of multi-

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national companies in the PRC.
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Conference Corner

September 1-2, 1998. ISO 14000 in China 1998, a conference sponsored by SEPA. Contact the China Center for Environmental Management Systems for more information. Telephone: 86-10-6492-4251; e-mail: cacems@public.bta.net.cn

September 8-11, 1998. International Symposium and 2nd Chinese National Conference on Rainwater Utilization, Xuzhou Jiangsu. Organized by the Geographical Society of China, China Academy of Sciences, in conjunction with the International Rainwater Catchment Systems Association (IRCSEA). For more information, contact Dr. Li Lijuan, Dept. of Hydrology, Institute of Geography, CAS, 917 Datun Road, Beijing 100101, China. Phone: 86-10-6491-4289; fax: 86-10-6491-1104; e-mail: liji@iog.ac.cn

September 9-12, 1998. ITEP China 1998, a conference that is co-sponsored by the Regional Institute of Environmental Technology. Contact Hanover Fairs Asia Pte Ltd. for more information. Telephone: (65) 220-9733; e-mail: info@hfasin.com

October 13-17, 1998. Water China 1998, a water treatment conference and exhibition. Contact Mr. Chen Liqiu for more information. Telephone: 86-10-6291-7828; e-mail: cischehe@sun.midwest.co.cn

November 10, 1998. Water China Forum, held by the Ministry of Water Resources. Contact the Ministry for more information. Telephone: 86-10-327-3322; fax 86-10- 6326-6190.

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