

# **Beijing Environment, Science and Technology Update**

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## **Climate Change Treaty Implementation Planned**

With the prospect that the Kyoto Protocol may enter into force in 2002, China and developed country partners are taking preparatory steps to cooperate on implementing the Protocol's Clean Development Mechanism (CDM) in China. An interagency leading group for CDM is being put together under the leadership of the State Development Planning Commission (SDPC), and bilateral and multilateral donors are financing feasibility studies for undertaking CDM projects in specific sectors. A donor coordination roundtable for CDM is to be convened in March.

China has long been thought to be a major potential beneficiary of the CDM — a scheme which allows developed countries to earn credits for helping with emissions reductions in developing country -- because of China's large and rapidly expanding energy demand, heavy reliance on dirty coal and low baseline level of energy efficiency. These factors create ample low-cost opportunities for reducing greenhouse gas (GHG) emissions. Some economic models have estimated that China could reduce its GHG emissions 15% below business as usual at an average cost of less than \$10 per ton of carbon. One study, conducted before the Protocol took final shape, predicted that 60% of all CDM benefits would accrue to China. It is no surprise, then, that bilateral

and multilateral donors are focusing on China as they prepare to implement the CDM. For example:

- In late November, China received \$570,000 from the World Bank, Germany and Switzerland to conduct a 18-24 month feasibility study on implementing CDM projects in the Chinese power sector;
- The Asian Development Bank (ADB) expects to launch a one-year CDM technical assistance project early in 2002, focused on energy efficiency and renewable energy at the provincial level;
- The Netherlands is financing a feasibility study for the iron and steel and chemical sectors, and is tentatively offering to purchase emissions reduction credits from any resulting projects at \$5-10 per ton;
- Canada is undertaking a \$13 million capacity-building project focused on the transportation sector and carbon sequestration, working with SDPC and several other Chinese partners; and
- The United Nations Development Program (UNDP) is contemplating three pre-feasibility projects working directly with Chinese enterprises, possibly emphasizing energy conservation or coalbed methane exploitation.

A donor roundtable on CDM has been scheduled for March, after a preliminary World Bank study is completed.

On the Chinese side, a central government leading group on CDM will reportedly be established soon, with SDPC in the lead. Core agencies, in addition to SDPC, will be the Ministry of Foreign Affairs and the Ministry of Science and Technology (MOST). SDPC is also overseeing the sectoral feasibility studies that are being financed by the World Bank, the ADB, the Canadians and the Dutch.

Although the U.S. Government has said it will not ratify the Kyoto Protocol, it

may be possible for U.S. private firms or NGO's to participate in CDM projects in China. Under the rules agreed to at Marrakech, emissions reduction credits from CDM projects are "fungible," that is; they can be traded internationally like other GHG emissions credits. The Marrakech Accords also allow developing countries to undertake CDM projects unilaterally (i.e. without the sponsorship of a developed-country government), and private parties and other non-state legal entities may participate in CDM projects and acquire and transfer credits. In theory, therefore, a U.S. firm, individual or NGO could participate in a CDM project in China, obtaining credits and either selling them on the open market, banking them, or applying them against a domestic emissions cap in a third country (not the United States) that is bound by the emissions reduction Protocol. China's national CDM authority would have to approve of such a plan, as would the CDM Executive Board.

Meanwhile, on the academic side of things, more than 200 experts from Chinese research institutions and universities attended the 2<sup>nd</sup> National Symposium on Climate Change in Beijing in late December. The theme of the conference was "Climate Change: Science, Economy and Diplomacy," and the proceedings stressed linking academic research with policy-making. Topics included greenhouse gas emissions and carbon circulation, climate change modeling, the impact of and adaptation to climate change, technology to slow down climate change and its economic impact, and the future of the Intergovernmental Panel on Climate Change (and China's negotiation strategy in it). (*Science Times*, December 28)

## **New Oil Law Puts Focus on Energy Security**

According to officials at the State Development Planning Commission (SDPC), a new draft law setting out rules for China's petroleum industry has been submitted to the

National People's Congress (NPC) for review and approval. Regulations issued in October 2001 to manage joint venture Sino-foreign investment in on-shore and offshore oil exploration will be incorporated into the new law. Other provisions will focus on pipeline protection, a government oil reserve, and overseas exploration and development of oil resources, in addition to standardizing rules to cover pricing and distribution.

By 2020, China is expected to use 390 million tons of oil per year, but only be able to produce 180 million tons from domestic resources. The remainder, 210 million tons per year, will have to be imported. China imported 36 million tons in 1999, and 70 million tons in 2000.

More broadly, by 2040, the SDPC predicts that China's total primary energy consumption will quadruple to 3.86 billion tons of standard coal equivalent, while domestic resources -- including coal reserves -- will only be able to supply 3.2 billion tons of standard coal equivalent per year (based on the anticipated mix of energy resources to be used by that time).

To cushion itself from possible shortfalls and price disruptions in its oil supplies, the Chinese government hopes to set aside 6 million tons by 2005 in a mechanism similar to the U.S. Strategic Petroleum Reserve. At the same time, petroleum major Sinopec hopes to be able to supply two to three million tons of imported oil per year by 2005 based on its own overseas exploration efforts. A competitor, the China National Petroleum Corporation (CNPC), already has foreign production bases in Venezuela, Kazakhstan, and the Sudan. (*Xinhua*, October 31 and November 6)

The April 2001 edition of *China Soft Science* includes a full review of energy security issues by Chinese Academy of Sciences researcher Zhang Lei. In the article, Zhang calls for China to add "diversification of oil and gas resources" and "resource internationalization" to its existing policies of "use coal as the basis" and "use domestic resources as the basis." He also

urged the rapid creation of a strategic petroleum reserve system.

Chinese leaders are simultaneously leveraging energy security concerns to underline the need for continued improvement in the efficiency of energy use in China. China's per capita energy consumption is one-half the global average, but the nation uses 40% more energy than OECD countries to produce each unit of economic output.

Currently, the SDPC and State Economic and Trade Commission (SETC) share responsibility for supervision of China's energy industry, with the SDPC setting policy and approving major investments, and the SETC implementing regulatory details. SETC officials have proposed the establishment of a new energy ministry or commission to regulate and manage the industry.

## Clean Production Ideas Gain Favor

Another new law in the works aims to promote clean production, or "green production," in China. This relatively revolutionary legislation, being prepared by the NPC's Environment and Resources Protection Committee, would attempt to incorporate environmental impact costs into product pricing, likely resulting in higher prices for basic resources such as water and fuel. The law's proponents expect that the legislation could promote a (theoretically at least) ideal situation where market mechanisms force heavily-polluting firms to clean up their act or go out of business. The law may also provide a framework for the institution of new environmental protection-related taxes, and require firms to include environmental audits in their annual reports.

The Asian Development Bank has provided technical assistance for the writing of the legislation. (*China Daily*, June 26) As of the end of 2001, however, it remains unclear if or when the legislation will be formally presented to the NPC, and details about the legislation's probable contents have not been widely publicized.

The State Council, State Environmental Protection Administration (SEPA), and SETC issued a series of documents from 1994 to 1999 urging government and business entities to promote clean production. But these papers were all relatively toothless. At the same time, some provincial governments -- for example Shaanxi and Liaoning -- have taken things further by directly linking environmental fines and clean production investments. (*Science Daily*, April 17)

Clean production concepts have received significant attention in Chinese corporate management circles in the past year or so, and foreign anecdotes about recycled copier machines and disposable cameras are becoming relatively well-known. Several leading corporations, such as Haier and Sinopec, are following in the footsteps of some of their foreign competitors by working to become publicly identified as "green" producers.

But the difficulty of promoting "clean production" in a country with huge domestic disparities in income and technological capabilities, and where market-oriented economics has only been practiced for a couple of decades, is considerable. Interviewed in the April 2 edition of *China Environment News*, a SEPA official listed five obstacles to promotion of clean production:

1. Current environmental laws and regulations do not include references to clean production concepts;
2. Pollution control laws have emphasized compliance with emissions standards, and ignored opportunities to build pollution prevention into production processes;
3. Relative to technologies for last-stage emissions treatment, clean production technologies are immature and occupy narrow market niches;
4. Some clean production technologies are quite expensive when first installed, and thus have not received strong government or policy support; and
5. Capital available is insufficient to stimulate a market, so progress on

R&D of clean production technologies has been slow.

SEPA officials have called for new government measures to promote clean production and clean production technologies, including tax incentives, low interest loans and reduced pollution fines for enterprises that incorporate the technologies. At the same time, they have noted that more basic policies such as an "environment tax" or "resources tax" would help promote the use of clean production technologies and processes.

While the promotion of "green production" in China will likely entail a long and difficult process, the very fact that it is being considered by at least some firms and government leaders to be a key goal is encouraging. Things have certainly progressed from fifty years ago when, as legend has it, Mao Zedong standing atop Tiananmen Gate said: "I hope in the future to be able to see factory chimneys in every direction."

## Serious Lead Poisoning in Beijing

About 20% of Beijing's children are estimated to currently suffer from lead poisoning, according to a recent study by the Chinese Academy of Preventive Medicine (CAPM). Children in three districts of the city -- one downtown, and two in the suburbs -- were tested for lead content in their blood. Some 17% of children in the downtown district, and 80% and 65% in each of the suburban districts, were found to have lead levels above the World Health Organization (WHO) standard of 100 micrograms per liter of blood.

Children with high levels of lead in their blood can suffer from retardation and stunted growth. Excessive intake of lead will cause children's intelligence quotient (IQ) scores to fall by an average of 14 points, and for every 100 micrograms of lead in each liter of blood, a child is likely to be 1.3 centimeters shorter on average.

CAPM's Gao Junquan told the Beijing Morning Post that children from 100

to 130 centimeters in height are particularly susceptible to lead poisoning from automobile exhaust, since heavy elements in the pollution tend to hover close to the ground. Another main source of lead poisoning is food. China's standard for lead levels in food is 0.5 micrograms per kilogram, considerably higher than the WHO standard of 0.2 micrograms per kilogram. Finally, in addition to the well-known problem of lead in paint, lead can come from toys, pencils, industrial pollution, and be brought into the home environment by adults who come in contact with lead in the workplace.

According to Professor Gao, other major Chinese cities such as Shanghai and Shenyang also have serious lead poisoning problems. (*Beijing Morning Post*, September 18)

## Mental Health Woes Among the Young

A rash of suicides among stressed Chinese junior high school and high school students has increased media attention to mental health issues (as well as adding fuel to ongoing debates over educational policy). One recent government survey, the largest conducted since 1949, found that 27% of elementary school students and 32% of middle school (junior high and high school) students have suffered noticeable mental health distress. (The same survey also found a sharp decline in physical fitness and eyesight among students, also attributed to students' heavy workload).

Suicide has in fact become the No. 1 cause of death among Chinese people between 15 and 35 years of age. Every year, an estimated 2 million people in China attempt suicide, and about 250,000 succeed.

Intensifying competition in Chinese society, along with a weakening of traditional social structures, are frequently cited as the main culprits behind China's increasing mental health problems. The Ministry of Health (MOH) estimates that China currently has 16 million people

suffering from serious mental illness, representing 13% of all disease cases in China. This latter proportion is expected to rise to 17% by 2020. (Another 6 million people suffer from epilepsy, which is counted separately.)

Despite the recent media attention given to suicides among urban youth, however, mental illness (and its most prominent statistic -- suicides) is in fact far from being a primarily urban phenomenon in China. In terms of suicides, rural people are at greater risk than urban residents, and women at greater risk than men. The ready availability of strong pesticides is often cited as a key reason for the high "success" rate of suicide attempts in rural China.

At 22 per year per 100,000 people, China's overall suicide rate is higher than that of Britain, the United States or Canada, but still half that of those countries in eastern Europe (such as Hungary and Lithuania) that high the world's highest suicide rates. (*Xinhua*, October 30, December 3 and December 6, *South China Morning Post*, October 27)

## Mental Health Surveys to Prepare for New Law

China's first truly confidential survey on the mental health of Chinese citizens -- involving 200 trained interviewers, 550 interviewees, and organized by the Ministry of Health and WHO -- began in December. The questionnaire will involve questions on temperament, insomnia, sexuality, and other issues, and is aimed at understanding better the relationship between social pressures and mental illness in China. (*Xinhua*, December 6)

At the same time, the U.S. National Institutes of Health (NIH) has awarded \$1.2 million to the China-Rochester Suicide Research Center to study the cultural and social factors behind China's high suicide rate among females. In the United States three times as many men kill themselves as women, while it is estimated that more than

two-thirds of suicides in China are by women. The lead researchers in the Rochester project hope to learn how "culture has an impact on the factors that determine suicide." (*Associated Press*, November 5)

It is hoped that these studies will help inform the preparation of China's first law addressing mental health treatment, which the MOH hopes to bring to the NPC before the Congress' current term expires in 2003. Officials have not made the draft legislation public, but say that it will address some key concerns such as stemming discrimination against mental health patients, and improving access to professional treatment services. (*Xinhua*, October 31)

China's capability to treat mental illness sufferers lags far behind the prevalence of disease. Access to timely treatment is sharply constrained by lack of information, funds, equipment and trained doctors.

The October 15 edition of the Shenyang-based *Liaoshen Evening News*, for example, criticized the city's mental institutions (particularly those run by private individuals) as substandard. The paper stressed that the city is not necessarily short of physical facilities, but rather that the quality of the treatment available at existing institutions is very poor, due to the shortage of trained professionals on staff.

Voluntary consulting services and hotlines are becoming increasingly common in some cities of eastern China, and helping meet demand for help from persons suffering from depression and other common forms of mental distress. Professional facilities often have their hands full focusing on more severe mental illness cases.

## New Family Planning Law Stresses Fatherhood

China's first Population and Family Planning Law, adopted by the National People's Congress December 29, has added fresh fuel to the growing public debate over gender roles in Chinese society, by

apparently enshrining fatherhood as a legal right. The new law, which will enter into force September 1, stipulates that men and women share equal responsibility for family planning. While recognizing the right of couples to have one child, however, the law reiterates restrictions on bearing multiple children.

The passage of the Family Planning Law follows last year's amendments to China's Marriage Law, which included new provisions on domestic violence and provided a basis for women to sue husbands who divorce them in favor of a mistress. Those amendments spurred numerous lawsuits that required the Supreme Court to issue rulings late last year clarifying the definitions of "domestic violence" and "illegal cohabitation." Some legal scholars now predict that the Family Planning Law may generate lawsuits by husbands against wives who refuse to bear children. One scholar even speculated that the new law could provide legal cover for spousal rape (*China Daily*, January 8), although both these assertions will have to be tested in court. The same scholar pointed out, for example, that another Chinese law on protection of women's rights states that women have the exclusive right to choose whether or not to bear a child.

Overseas and domestic media accounts have highlighted the fact that the new law does little to revise China's unpopular "one-child" birth control policy. Zhang Weiqing, head of China's State Family Planning Commission, said the new law neither relaxes nor tightens China's population policy.

Starting in the early 1980's, China has employed various measures to limit each couple to one child in an effort to control the size of the nation's population. As a result, China's official 1970 birth rate of 33.4 per thousand fell to 15.2 per thousand by 1999. Although the "one-child" emphasis is the most famous element of China's population control policy, at present 19 provinces in China permit rural couples to have a second child if their first child is a girl. In 27 of China's 31 provinces, if both the husband

and the wife were only children, the couple is allowed to have two children. Members of ethnic minorities are in many cases permitted more than two children.

In many rural areas, couples successfully evade family size restrictions, or simply pay the fines for having additional children. In urban China, meanwhile, the rapidly rising economic cost of raising a child has combined with continued tight enforcement of birth restrictions to keep urban birth rates very low. (*People's Daily*, December 30, *Xinhua*, December 28)

## Dire Warning for Western China's Ecology

A December 29 report by the State Environmental Protection Administration (SEPA) on environmental conditions ecological balance in China's western provinces paints a bleak picture of an increasingly degraded landscape destroyed by human activity. SEPA's report -- prepared in cooperation with the Chinese Academy of Sciences, the Survey and Mapping Bureau, and officials from 12 provinces and autonomous regions -- notes that arid western China has a fragile ecosystem that is easily damaged and difficult to repair. Mining, farming and overgrazing on marginal land has destroyed the ecological balance over vast areas, leaving the land barren, eroded, and flood-prone.

In surprisingly sharp language, the report describes an ecosystem in crisis -- with desertification spreading, natural disasters intensifying, and biodiversity declining. Forest coverage (as measured in hectares) is up, but the "quality" of forests and their ability to support life has fallen. Meanwhile, large territories are salinized and denuded, often due to overgrazing, leading to serious wind and water erosion. The report notes that after converting grasslands and forests into arable land, farmers can win a short-term gain, but often are later forced to abandon the land as

agricultural productivity falls and the cost of maintaining the land rises.

The report is uniformly pessimistic about the future, indicating that at best ecological trends currently show a slowing in the speed of Western China's devastation. In net terms, the data shows desertification and erosion continuing to worsen. While offering no direct solutions, the report suggests that education and poverty alleviation will prove to be the keys to sustainable economic development in the western provinces. (*SEPA website* ([www.zhb.gov.cn](http://www.zhb.gov.cn)), December 29)

## Geography Learning Project

A consortium led by the U.S. government is sponsoring an international environmental education initiative designed to encourage high school and university students around the world to use geographic methods and tools to learn about how their communities are changing, and how they can be made more sustainable. The project, titled: "My Community, Our Earth (MyCOE) — Geographic Learning for Sustainable Development," is linked to the World Summit on Sustainable Development to take place this year in Johannesburg, South Africa, and sponsored by the U.S. Department of State, together with the Agency for International Development, Department of Agriculture, United Nations Environment Program, National Geographic Society, Association of American Geographers, and the Environmental Research Institute. Project proposals must be completed by May 31. Details can be found on the project's website at [www.geography.com/sustainable](http://www.geography.com/sustainable).

### In Brief:

- As of January 1, cars manufactured in or imported into China may not have air conditioners using CFC-12. CFC-12, more commonly known as freon, was banned in the United States and other developed countries several years ago

under the Montreal Protocol on Substances that Deplete the Ozone Layer. China and other developing countries have until 2010 to fully phase out production of the substance. (*China Environment News*, January 5)

- Xinhua News Agency reported that, at the end of October 2001, China had 901,000 registered drug abusers (roughly 1 in 1000 people), including 25,900 newly registered addicts. Of the total, 745,000 (more than 80%) were heroin abusers. Of the more than 28,000 confirmed HIV infections reported in China, 19,000 were caused by intravenous injection. (*Xinhua*, December 29, *China Youth Daily* December 30)
- In a recent geological survey, an underground reservoir has been found in the arid Tarim basin of northwestern China. With a total water resource capacity of 36 billion cubic meters (only 3.3 billion cubic meters less than Three Gorges reservoir), its annual water supply capacity is 1 billion cubic meters. Chinese geologists also found a huge underground reservoir in the Wei Gan river valley in the northern rim of the basin. (*Science Times*, January 7)
- The China Council for International Cooperation on Environment and Development (CCICED) estimates that the economic value provided each year by China's natural vegetation exceeds 10 trillion RMB (\$1.2 trillion). This is greater than China's official GDP last year, which was reported as 9.6 trillion RMB. The study, prepared by the CCICED's biodiversity working group, considered the role natural vegetation plays in preventing soil erosion, regulating the climate, controlling air pollution and preventing natural disasters, as well as its direct value as a source of biological diversity and renewable energy. The group calculated that these benefits each year add up to 4.7 trillion RMB in "current" value and 6.5 trillion RMB in "potential" value. The "current" value alone would equal

49% of GDP. (*China Environment News*, January 4)

- A Beijing inventor claims to have developed a washing machine that uses no detergent. The so-called “elemental oxygen clothes washer” uses electrolysis to split water molecules into hydrogen and hydroxide ions, which then oxidize the dirt, at the same time killing bacteria. Wastewater from the machines is said to meet China’s level II standard -- suitable for drinking-water reservoirs. The inventor has built five prototypes and is looking for partners to scale up production. (*China Environment News*, December 31)
- The State Economic and Trade Commission’s recently promulgated 10th Five-Year Plan for New and Renewable Energy calls for expanding the use of renewable energy sources (not including hydropower and traditional biomass burning) to 13 million tons of standard coal equivalent by 2005. In the process, electricity will be brought to 1.3 million remote areas, benefiting 5-6 million people. Priority will be given to developing solar, wind, biomass and geothermal energy. The document is vague in terms of specific policies or resources to reach those goals. (*China Environment News*, January 2)
- The China Meteorological Administration plans to establish an automated network to monitor and forecast dust storms in northern China. The system is expected to go into operation in April, with a total investment of 30 million RMB (\$3.6 million) in the first stage. North China dust storms have increased significantly in both frequency and intensity over the past three years, primarily because of land degradation and below-normal rainfall. Last spring the region experienced 13 dust storms, of which three were considered “serious.” Dusty weather prevailed about one day out of

every two. (*China Environment News*, January 9)

- Beijing will continue reducing rice-growing areas within the municipal area to save water. In 2002, Beijing will withdraw 4,600 hectares from rice production, and plant drought-resistant vegetation instead. In the past two years, the city has halted rice growing on more than 10,000 hectares. Agriculture consumes more than 50% of Beijing’s annual water supply. (*China Daily*, January 9)
- The Ministry of Health has completed a computerized, nationwide disease reporting database, which will assemble weekly data reports from local epidemiological stations. Previously, disease monitoring was handled via handwritten reports forwarded by mail on a monthly basis. The system cost \$48 million, and took three years to construct. (*Health News*, December 25)
- China’s National Space Administration is considered sending a non-recoverable probe to the moon. The probe would be China’s first deep space vehicle, and an important precursor to chasing the official dream of putting a Chinese astronaut on the moon. (*Xinhua*, October 9)

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