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Editor: Changhua Wu Guest Editor: Jeffrey Logan

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In Brief

The Ministry of Water Conservancy recently completed the establishment of a nation-wide water environmental monitoring network covering all the major rivers, lakes and reservoirs in China. The network includes more than 3000 water quality stations, 3000 water quality sections, 200 river system water quality background value stations, and 100 water quality station at coastal river outlets.

The city of Yichang, at the mid-point of the Yangtze River will invest over US\$2.5 million in relocating about 50 heavily polluting factories from its center, in an attempt to preserve the city's reputation as a tourist attraction.

In an effort to preserve the resources of China's mountainous and sub-tropical province of Yunnan, authorities have set a target of attaining 30% forest cover and setting aside 8% of the province's land mass as preservation zones.

China's many township enterprises will need to undergo an EIA process in the future before commencing operations. The 23 types of township enterprises make up the bulk of China's private sector.

German companies and the German government are presently very active in trying to sell their environmental technology and solutions in the Chinese market.

Statistics shows that motor vehicles in China now emit nearly 10 million tons of CO₂, and more than one millions tons of hydrocarbons and NO_x respectively each year. By the year 2000 forecasts indicate China will have 18 to 20 million motor vehicles and 44 to 50 million by the year 2010. Without effective energy saving and pollution control measures, the NO_x from vehicular sources is predicted to reach 1.19 million tons, hydrocarbons at 6.5 million tons, and CO₂ at 14.12 million tons by the year 2000, and increase to 2.28 million tons, 9.3 million tons and 24.76 millions tons respectively by the year 2010. (CEN, 5/6)

Green Revisions Of Criminal Code Enforce Environmental Protection

The enforcement of environmental protection laws will be boosted by China's revised criminal code, which will come into effect on October 1 this year. President Jiang Zemin signed a presidential order to this effect on March 14.

The revised criminal code adds articles to the sixth section of chapter six, punishing violations against the environment and resources.

In the sixth section "Crimes Against Environmental or Resource Protection" of the sixth chapter of "Crimes Against the Order of Social Management," Article 338 stipulates that those who, in violation of state regulations, discharge, dump or dispose of radioactive or infectious pathogen-containing waste, poisonous substances or other dangerous wastes on land, water or into the air, or who cause major environmental pollution accidents that give rise to serious consequences of major loss of public or private property or life, may be sentenced to up to three years in prison, or a fine or both a fine and criminal detention. In serious cases, those who are found guilty may be sentenced to three to seven years in prison and a fine.

Article 339 provides that those who violate state regulations by dumping, stockpiling or disposing of solid waste from outside of the country may be sentenced to imprisonment of up to five years, or a fine, or both. Those who cause major environmental pollution accidents that give rise to major losses of public or private property or bring serious health hazards may be sentenced to five to ten years in prison and a fine. Those who cause particularly serious consequences may be sentenced to a prison term of more than ten years.

Those who, without the permission of relevant State Council departments, import solid waste for recycling and cause major environmental pollution accidents that give rise to major loss of public and private property or bring serious health hazards may be sentenced to up to five years in prison and a fine. Those who cause particularly serious consequences may be sentenced to five to ten years in prison.

Article 340 stipulates that those who, in serious violation of the law relating to protection of aquatic resources, catch aquatics in areas or periods forbidden to fishing or employ forbidden tools or methods may be punished with a prison term of up to three years or a fine.

Article 341 provides that those who illegally hunt or kill rare or precious wild animals that are under state key protection, or illegally purchase, transport or sell such animals and their products may be sentenced to a prison term of up to five years and fined.

Those who illegally hunt wild animal resources in areas or periods forbidden to hunting or employ forbidden tools or methods may be sentenced to a prison term of up to three years, criminal detention or

a fine.

Under Article 342, those who, in violation of land management decrees, illegally change land to other use and cause destruction may be punished with a prison term up to five years or criminal detention and a fine.

Article 343 stipulates that those who violate the mineral resource law by exploiting minerals without licenses or illegally mining in state-planned mining areas, mining areas of major importance to the national economy and mining areas that belong to others, or who exploit special minerals protected by the state, and do not stop their exploitation when ordered to do so, may be sentenced to a prison term of up to three years, criminal detention and a fine. Those who cause more serious destruction to mineral resources may be sentenced to three to seven years in prison.

Article 344 provides that those who, in violation of the forestry law, illegally log or destroy forestry resources may be sentenced to a prison term of up to three years, criminal detention and a fine. More serious violations may be punished with imprisonment of three to seven years and a fine.

Under Article 345, those who illegally log forests or other trees in huge quantities may be sentenced to a prison term of up to three years, or criminal detention and a fine. More serious offenders may be punished with a prison term of three to seven years or more than seven years if the quantity of trees illegally logged is particularly large.

Article 346 stipulates that if units that violate the stipulations in articles 338 to 345 are fined, then the unit leaders and others who are held directly responsible may be punished according to the above articles.

City Profile -- Lanzhou: Wind Scheme To Blow Away Pollution

Lanzhou, an important industrial and transportation hub in Northwest China's Gansu Province, is badly in need of wind to blow away its industrial smog. The city lies in a ravine hemmed in by mountains on all four sides and has no wind at all for an average of 300 days a year.

The city is like a sealed bottle, with all the smoke discharged by industrial establishments, automobiles and household chimneys compressed in the space over the city. The smog is particularly serious during winter.

For a blue sky project that incorporates five major environmental protection projects, the city has invested 1.4 billion RMB, a major outlay for a city that is still relatively poor and underdeveloped.

In the late 1970s, Lanzhou residents joked that the sun and the moon, a sunny day and an overcast day looked just the same in the city, and that people's noses were as black as chimneys. Vehicles on the city's roads have to turn on their headlights after 5pm.

The population has grown, the economy has expanded and the climatic conditions remain the same. But the air quality has significantly improved since the 1970s thanks to environmental protection efforts of the city.

People begin to imagine that if they cut the top off the Daqing Mountain or drilled some wind tunnels through the mountain, the city might get some wind. When the city decided to launch a "wind borrowing" project the local residents were very much surprised. The project was a financial as well as a technical challenge.

Some foreign news media mocked the plan. Newsweek on October 7, 1996 reported the plan under the title "Removing the Mountain," saying local people, after trying a number of steps, had thought up a fantastic step to create a giant tunnel to introduce wind. It said that the scheme reminded people of the traditional Chinese proverb of the foolish old man who tried to move a mountain.

The city's environmentalists are quite careful about the plan. Yu Xionghou, director of the Lanzhou EPB, said that though it has been the wishes of the local residents for a long time and the bureau has actually proposed it, people have to be very cautious about it. Conclusions can only be drawn after it has materialized, he said. If no wind blows across the city after two years of construction, what will be done? Yu queried.

As the Daqing Mountain lies in the vicinity of the city proper on the bank of the Yellow River, it is geographically favorable to development. In the first phase of construction when the top of the hill is cut off, 200 hectares of land will be created, offering real estate development potentials for the land-thirsty city.

The project calls for an investment of 99.6 million yuan, or 498,000 yuan per acre. The prospective profits will be enormous, so it is bound to be a magnet for real estate developers.

A city government official said at the signing ceremony of the project that the project is an effort to utilize the barren hill. It will add acreage to the city. Even if no wind was introduced, it is still worthwhile, he said.

WATER CRISIS -- Yuanyangchi Reservoir in Gansu Province

Yuanyangchi Reservoir, located in the west end of Gansu Province, has been the major water source for 110,000 residents in Jinta County. And now it is black, like soy sauce.

The annual average precipitation in the county is only around 58.3 mm, with an evaporation level of more than 2,600 mm, almost 45 times that of the precipitation. Situated to the west of Badanjilin Desert, the whole county depends on the Beida River, which runs into the Reservoir, for survival.

Beida River rises in Qilian Mountain, irrigating 18,667 hectares of farmland along the way. But ever since

the 1990s, large amounts of industrial waste water and sewage have been discharged into the river. As a result, the reservoir has turned into a sewage pond. All the major pollutants exceed State standards by a large margin, even by a few hundred times. The groundwater which depends on the river for its water input has also been severely polluted.

The incidence of infectious diseases and other diseases has been rising sharply. Compared to 1986 levels, emergency room visits have increased by 67 percent, and the number of cancer patients have risen almost 25 times.

A local investigation showed that between 1992 and 1994, irrigating farmland by using polluted water had killed many crops, with a total economic costs at more than 60 million yuan.

Each year there are about 10 million tons of waste water discharged directly into the river. Among the polluting sources, the most dangerous ones include a paper mill and a sewage treatment plant. Though some efforts have been made to reduce the pollutant discharge, in the past ten months, no obvious progress has been made. The reservoir remains black.

Investigation discovered that the paper mill which was closed last year is back to operation. Though equipped with a waste water treatment facility, the mill has not reached the required standards for its discharged waste water. It was reported that some of the black liquid has been discharged into the desert, six kilometers away from the factory.

The latest order from local government to the paper mill is to discharge the waste water into the Gobi desert, 20 kilometers away from the river. And the paper mill was once again ordered to shut down. (CEN, 4/26)

13 Cities Ready For Weekly Air Quality Report

Thirteen major cities in China are going to announce their air quality status weekly beginning June 5. This is based on a decision by the State Council, released on January 21, 1997.

Each city is going to announce the weekly report through local news media, and, at the same time, send the data to the China Central Station of Environmental Monitoring, which will report the relevant information to other decision-making institutions.

Beijing, Shanghai, Tianjin, Shenyang, Xian, Guangzhou, Wuhan, Chongqing, Nanjing, and Hangzhou were the first ten listed in the decision. Later, Dalian, Xiamen and Zhuhai joined the group.

China Central Station of Environmental Monitoring has been in charge of this plan and its operation. Air pollution indicators, key pollution sources and the health effects from air pollution have been tabled. The major air indicators cover SQ, NO_x, and TSP.

In order to guarantee quality, accuracy and

compatibility of data among cities, each city has to have, on average, at least five monitoring spots. Beijing has ten.

The currently envisioned system will require a summary report of the previous week's air quality. This is expected to develop into a daily report or forecast in the future.

The first internal trial report was released on April 4 and will continue that way until June 5 when public announcements are made. (CEN, 5/1)

Xuzhou Recycles Industrial Trash Into Bricks

Last year, one quarter of the newly constructed buildings in Xuzhou, Jiangsu Province, used industrial garbage bricks, which means that one out of every four buildings is a "trash" building.

There are 640 clay brick making factories in Xuzhou, occupying an area of around 2,367 hectares of land. They eat up more than 533 hectares of farmland every year. At the same time, a large amount of industrial waste has long been dumped and neglected.

The city has 160 coal mines, which produce more than 4.5 million tons of coal gangue, accumulating to nearly 34.55 million tons so far. One power plant in the city produces more than 1.2 million tons of powdered coal dust. The iron and steel plant need to purchase new land each year to pile the 120,000 tons of waste dregs.

Recently, a group of enterprises have emerged to turn these industrial wastes into bricks. By the year 2000 it is forecast that 42 percent of the newly constructed buildings in urban and rural Xuzhou will use such bricks while the number is expected to reach 70 percent in the downtown area. (CEN, 5/8)

Polluted Seafood Poses Worry For Consumers

China, as the leading marine farming nation in the world, produced 20.5 kg of seafood per capita in 1995, 14.5 kg more than in 1984. The country exported 740,000 tons of aquatics worth 3.29 billion US dollars and 195,000 tons of shellfish worth 540 million US dollars in 1995.

As more and more seafood is making its way to people's dinner tables, many people are concerned about its safety.

According to the Yantai Aquatics General Company, all the seafood must be tested carefully before it is exported. When the aquatic products are very young, tests are already conducted to examine the content of microorganisms, heavy metals and agricultural chemical residues. Similar tests will be done again when they grow and are ready for export. They have to meet all the requirements of the importer

nation.

Four billion tons of industrial waste water, 200,000 tons of sewage and 43 billion tons of waste water from shrimp and prawn breeding grounds spill into the sea in China every year. The Bohai Bay has reached a critical point after which it could become a "dead" sea of pollution.

There was a major outbreak of hepatitis A in 1988. The chief culprit was oysters that were contaminated by human waste and sewage discharged into the Xiaohongmiao sea area.

Red tides have been common in China's coastal areas in the last few years, casting shadows on clam farming.

Some 3,000 people were infected by hepatitis A in Ningbo in 1979 after they ate contaminated oysters. Ten times more people succumbed to the disease for the same reason in Shanghai in 1983.

The number of victims reached 420,000 in Jiangsu, Zhejiang and Shandong provinces from eating contaminated oysters from Qidong, Jiangsu Province in January 1988.

A total of 136 people in 25 households in Ziyao village of Xingchen Township in Dongshan County, Fujian Province, were poisoned by PSP on December 1, 1986. One died and 59 people were in critical condition.

Data shows that 10 percent of Chinese people are hepatitis victims or carriers.

Professor Pan Shunchang of the Chinese Academy of Preventive Medicine said that many diseases are caught from eating contaminated seafood. When all conditions are in place, epidemics will break out, he said.

He noted that China has carried out very few studies on the relationship between environmental pollution and human health. No one is clear about actual relations between pollution and human health.

Professor Li Xiaochuan of the Yellow Sea Research Institute said that Chinese managers give little thought to the safety of seafood. Some have never heard of PSP.

Some marine farmers feed their fish with chicken waste and the leftover bits and pieces of a shoe factory. In this way, cadmium will make its way into the body of the fish and the water.

Pan said it is necessary to establish a nationwide network to check aquatic contamination. (CEN, March)

Severe Air Pollution A Way Of Life In Beijing

In Beijing, air quality has become something of an oxymoron, and the situation is unlikely to improve demonstrably any time soon.

By some estimates, the air in China's capital city is two to five times dirtier than that of Los Angeles. Breathing the air for a day is equivalent to smoking three packs of unfiltered cigarettes, according to one

study.

Things have reached such a pitch that the Chinese government, loath to admit failings of any kind, has declared pollution a national crisis. Much of Beijing's pollution comes from massive iron and steel works on the edge of the city, plus coal-fired household heaters, which together bathe the city in sulfur-dioxide and soot emissions.

But for many of China's leaders and citizens, the war on pollution and the war on poverty cannot be fought at the same time, forcing a grim political choice in which the environment loses. (Greenwire, 5/4)

Clean Coal: China, Germany Join Forces On Processing Plant

In a quest to give clean-coal technologies "top priority," China will work with Germany to build "the world's first" plant that would convert coal directly into clean, high-quality fuel.

The processing plant, to be sited in southwestern Yunnan province, would convert 1.7 million tons of lignite coal into 4 million barrels of diesel and gasoline each year.

China currently relies on coal for 75% of its energy needs, most of it "dirty" and high in sulfur content. To improve its air, the country's energy policy focuses on cleaner-burning processes like liquefaction and gasification.

The China Coal Research Institute will team up with German researchers and conduct a feasibility study of the project over the next two years. The plant could be operational within four years. (Greenwire, 5/12)

Pollution Causes Large Fish Kill

More than 500 tons of carp died from heavy pollution in a lake in one of central China's main industrial cities, according to China's ECONOMIC DAILY. The dead fish spanned over a mile of Moshui Lake in Wuhan.

Prior to the 1980s, the lake sustained a variety of aquatic life, including clams, silver carp, and soft-shelled turtles. As Wuhan's industrialization sped up under economic reforms, Moshui became "a cesspool of sewage and industrial waste." Efforts to clean the lake have not materialized (Greenwire, 5/12).

Tens Of Thousand Of Most Polluting Factories Shut Down

A total of 62,561 factories causing serious pollution have been shut down in China, or 85.5% of those that should be closed. Factories closed so far include small paper mills, leather tanning factories, printing and dyeing mills, coking plants using outdated

production processes, and other factories causing serious pollution.

The action came following a decree of the State Council, China's cabinet, last year that required all of the country's 15 types of small-sized factories causing serious pollution to close their doors.

According to the figures, the number of such polluters required to be closed had increased to 73,149 as of March 31, 1,556 more than at the end of January.

But the picture gets twisted when on-the-spot investigations in some areas discovered factories that were once closed are opened again. No comprehensive statistics have been done on the total number of such factories. In Wuji County of Hebei Province, where the leather tanneries account for 40 percent of its local GDP, the war of shutting down the polluting factories has been a long-lasting one. In one of the largest villages in the county, with a population of around 6,000, there were still more than 400 tanning drums operating in April when a journalist visited the village. (Dow Jones Newswire, 4/15)

\$200m Reforestation Effort Begins To Take Root

With the backing of the World Bank, China has embarked on a number of reforestation projects that officials hope will reverse "decades of destruction" and "environmental carnage" caused by the rapid economic growth in the country.

The effort, supported by a \$200 million World Bank loan, will reforest land for both commercial and environmental purposes. By 2000, China expects to be one of the few countries with more forested land than it had in 1990.

But convincing cash-starved peasants to plant trees now and wait for the rewards is "difficult." In some areas, the government is paying villagers \$2 a day for planting trees. "If all goes well," some of the projects will begin showing a return in six years, when newly-planted eucalyptus trees will be mature enough to harvest for sale. While some of that money will go toward paying back the World Bank loan, most of the income will go to the villagers.

An official with China's forest ministry said "Not only does the program greatly improve the local environment, tree plantations will eventually become a major source of timber supply. That reduces the harvesting pressure on natural forests we want to preserve." (Greenwire, 4/20)

Sino-Italian JV Making Ozone-Safe Compressors

ZANUSSI Elettromeccanica Tianjin Compressor Co Ltd, a Sino-Italian joint venture, is the first company in China able to manufacture CFC-free refrigerator

compressors.

CFC -- chlorofluorocarbon -- is an ozone-depleting chemical compound containing freon that is used as a cooling agent. Many countries have banned the use of CFC because freon is suspected of playing a role in the destruction of the atmosphere's ozone layer, which protects the environment from direct exposure to ultraviolet sun rays. The Chinese Government has promised to phase out CFCs by 2005.

Zanussi Tianjin will expand its annual production capacity to 3 million compressors including CFC-free R134a compressors by 2000 from the present 1 million units, according to company officials.

The number of R134a compressors Zanussi produces is expected to meet part of the growing demand in the domestic refrigerator industry, which is working to phase out CFCs as cooling agents in accordance with international environmental protection efforts.

Now, almost all of the CFC-free compressors are imported. Domestic refrigerator manufacturers used more than 12 million compressors in 1996, including more than 2 million CFC-free compressors, most of which were imported, said Xu Dongsheng, an official with the China Household Electrical Appliances Association.

Because CFC-free technology is still new to the domestic industry, technical problems emerged last year that could not be immediately solved.

Some manufacturers argued that it is too early to expect the industry to produce CFC-free refrigerators, but others insist that it is a need that must be satisfied rapidly.

Wang Hengli, deputy-general manager of the Tianjin company, said that the market demand for CFC-free compressors will grow even faster as the 2005 deadline approaches.

Besides Zanussi Tianjin, other compressor manufacturers are also working on CFC-replacing compressors.

Zanussi Tianjin is the first joint venture refrigerator compressor company in China. It is one of seven subsidiary compressor companies of Electrolux Compressors, whose total output was 20 million units in 1996. Zanussi officials said they will set up another joint venture compressor company in Shanghai, with an expected annual output of 1 million units.

(April 10, 1997)

China Needs More Support From GEF For Environment Protection

State Councilor Song Jian met with Global Environment Facilities (GEF) Chairman El-Ashry in Beijing on Wednesday, saying that China needs more support from the fund to carry out environmental protection research and projects.

During the meeting in Zhongnanhai, the headquarters of the Chinese central government, Song said that China has received great support from

GEF. The eight environmental protection projects set up by GEF in China have begun to play their due role in the real world, serving as showcases and driving forces for the country's move to protect the environment and achieve sustainable growth.

He said that China needs to address four most important issues to achieve sustainable growth in the 21st century, namely population control, grain self-sufficiency, water supply and environment protection.

He said that China wishes to continue cooperation with GEF and obtain more financial support from the fund so as to achieve more success in environmental research and protection projects.

El-Ashry said that the environmental policy and methods adopted by the Chinese government so far are very impressive. All levels of the government attach importance to environment protection. He said that China's efforts to sustain a high rate of economic growth while protecting the environment will provide lessons and experiences for other developing countries.

Ashry arrived in China for inspection of GEF projects in early May.

China Makes Progress In New And Renewable Energy Development

China has scored great achievements in developing renewable energy from solar, wind, geothermal and tidal sources.

By the end of 1995, the annual utilization rate of renewable energy had reached 300 million tons of standard coal, mostly from straw stalks and fuel wood used by the farmers as living fuel, accounting for a quarter of the total national consumption of primary energy and over 47 percent of energy consumption in rural areas.

The country has made world-renowned progress in small-hydro power utilization, said Wang Xiwu, director of the Environment Protection and Energy Department under the Ministry of Agriculture, at the on-going World Energy Council Asia Pacific Regional Forum.

By the end of 1995, more than 6,000 small-hydro power stations had been set up with a total installed capacity of 16.6 million kW, generating 49 billion kWh of electricity, accounting for 25 percent of the total that can be exploited.

Some 75 percent of the rural households in China have installed coal-saving stoves. Over 5.7 million rural households used biogas with annual biogas production of 1.47 billion cubic meters.

In terms of sunshine utilization, there were 4.49 million sq. m. of solar heaters, 5.75 million sq. m. of passive solar houses, 34,000 sq. m. of solar farm-use greenhouses and 140,000 sets of solar stoves.

Wind energy has been used for major electricity generation. To date, 140,000 sets of household mini and small wind generators have been applied with a capacity of 12,000 kW, mostly distributed in the

remote pastoral areas, mountain areas, and islands. China has imported medium and large wind generators from Denmark, the Netherlands, and the USA to equip 14 power plants which have 120 sets of generating units with a total capacity of 30,000 kW.

The total tidal energy that can be exploited in China is 2,170 kW, 90 percent of which is located in Zhejiang and Fujian provinces. Eight tidal power stations have been set up with a total installed capacity of 6,120 kW.

The reserves of small coal mines that can be exploited reach 10 billion tons. The reserves produced 520 million tons of coal in 1994, making up 43 percent of the national raw coal production. (Xinhua, April 23, 1997)

Vehicle Emissions Pollution Control/Lead Phaseout Seminar

The USEPA cosponsored two seminars in China in early March, focusing on measures to phase lead out of gasoline and to control vehicle emissions. The first, held in Shanghai from March 3-7, was organized by NEPA and included participants from all national level stakeholders as well as representatives from large municipalities. Co-sponsors included the World Bank. The Shanghai seminar resulted in endorsement of a plan to phase lead out of gasoline completely by 2000, and by 1998 in eight major cities. SINOPEC, China's state-run petroleum corporation (which produced about 80% of the gasoline used in China), announced a 15 billion RMB investment plan to accomplish this. The second seminar was held in Xiamen in cooperation with the International Institute for Energy Conservation (IIEC) as part of their integrated transportation project there. It was hosted and organized by the Xiamen EPB and focused on municipal level measures to control motor vehicle air pollution. USEPA plans to continue working with NEPA to assist in the implementation of lead phaseout and emissions controls.

National Oversight Committee to Supervise Factories' Performance

China has set up a national oversight committee to ensure factories and other polluters meet strict environmental standards. Committee head Xie Zhenhua, Administrator of the National Environmental Protection Agency, said that the group will help enterprises "rationally use natural resources, save energy and reduce discharge of pollutants."

Bringing together experts from the National Environmental Agency and the State Technical Supervision Bureau, the committee will be on the front line in China's war against environmental pollution. Xie said his group will focus on enforcing strict ISO-14000 standards aimed at unifying global environmental management and promoting

sustainable development.

Adoption of ISO-14000 regulations is also expected to boost public awareness of environmental protection. Xie adds the group will work to establish China's own environmental certification system in line with domestic standards and experiences.

He hopes China's 8 million enterprises will be eager to embrace the standards and help avert an environmental catastrophe in the developing nation. (UPI, 5/28)

Round-Up: Progress Made, More Challenges Ahead

By Changhua Wu and Andrew Liu

With the consensus on how serious China's environmental problems are, the next most challenging issue is how to control its deterioration and then further improve the environment. Reliance on its own efforts first, and then seeking international support in terms of financial resources, technology, and knowledge and experience are among the suggestions from one leading Chinese environmentalist and law-maker.

Dr. Qu Geping, Chairman of the Environment and Natural Resources Conservation Committee of the National People's Congress, made these remarks during his last trip to the States, at a China environment seminar, sponsored by the Professional Association for China's Environment (PACE).

If a country does not work hard enough, God cannot help either, Dr. Qu cited one other high-level Chinese decision-maker, to emphasize how important it is for China to make its own efforts in solving the environmental problems.

Even though the isolation of China from the rest of the world has been broken, he said, compared to the United States and other developed countries, China still lags far behind in communication and information, and many other aspects.

CLIMATE CHANGE and KYOTO MEETING

At international environmental fora, one of the most discussed issues this year is climate change and what will come out of the upcoming Third International Meeting on Climate Change, which is to be held in Kyoto, Japan, this December.

China as a leading developing country and the third largest CO2 emitter in the world will reiterate the importance of the adherence to the three major principles adopted at the Rio world environment summit in 1992. The three principles are that the developed countries shall take the lead in reducing the emissions of CO2, provide additional financial support, and promote technology transfer to developing countries.

Then, Dr. Qu said, China will support the Joint

Implementation Plan, under which the developed and the developing countries will work collaboratively to reduce the CO2 emissions.

Currently, around 80 percent of the total CO2 emissions is from the developed world, with the other 20 percent from the developing countries. If the world does not reduce the 80 percent first, even with the other one-fifth reduced, the major problem won't be solved.

With a per capita energy consumption of one ton of standard coal, around one-fifteenth of the US, China is using more coal to satisfy its increasing energy demand as a result of rapid economic growth. China burned almost 1.3 billion tons of coal last year.

Dr. Qu joked about how unfair God have been to China for putting very limited amount of natural gas under its territory. He also pointed out the difficulties China is facing to reduce the CO2 emissions from coal-burning.

To increase the efficiency of coal use is a most challenging issue in China, he said. With limited capacity but great potential, China has to depend on the international community for financial and technological help. And he believes that the Joint Implementation Plan is one good option.

One example given by the US Under-Secretary of the State Department, Tim Wirth, during his conversation with Dr. Qu is that in the US, if it costs \$100 to reduce one ton of CO2 emissions, while in Brazil, or China, it costs probably only \$5. In economic terms, it makes great sense for the US to help reduce the CO2 emissions in Brazil or China.

There are many concerns from other developing countries about being taken advantage by some developed countries in this process. But Dr. Qu noted, how to divide the reduction shall be negotiated and agreed by the two countries involved. At the same time, it might be a good idea to have a third country supervise the process.

ELECTRIFICATION

Air pollution has been a major environmental issue for cities in China, said Dr. Qu. Many cities have spent tons of money controlling air pollution, but the reduction can hardly catch up with the increase.

For instance, Beijing spent five billion RMB yuan during the last Five-Year Plan period. However, no obvious progress has been observed, because of the increasing use of coal. The city now consumes around 30 million tons of coal each year.

An obvious option of solving this problem seems to replace coal with natural gas. A pipeline is going to be finished to channel gas from northern Shaanxi Province, 3,000 km away from Beijing, to the country's capital. But the limited amount will only take the tip of the iceberg.

Dr. Qu said that the possible solution lies in electrification some Chinese cities, such as Beijing. He is going to host an expert workshop later this year in Beijing to discuss the feasibility of such a plan.

WATER SHORTAGE and POLLUTION

Rapid economic growth has brought with it another prominent challenge in China -- water shortage and water pollution. The two re-enforce each other, which is expected to become a factor limiting the future economic growth.

Dr. Qu attributed the problem to uneven distribution of water resources, irrational utilization of water, and rampant discharge of waste water into rivers, lakes and other water systems.

Some cities have felt the pressure from water shortage and pollution. In many parts of China, industries and households have been severely affected by water crisis.

To solve the crisis, cities nationwide are catching up with each other to build up waste water treatment plants. Some cities are even building a few such plants at the same time. Dr. Qu visited Weifang, Shandong Province, last year, where he was shocked to discover that there were six such plants being constructed the same year.

Tremendous amount of investment is needed to build waste water treatment plant. Still a developing country, where millions of the people are still living under the poverty line, China is struggling with the financial limitation to fight with its environmental problems.

PRIVATIZATION

The State-owned enterprises have been a big headache for the government. Generally speaking, these enterprises have very poor economic performance and efficiency. According to Dr. Qu, the government has started some policies aimed at improving the efficiency of 1,000 such enterprises.

The direction is to follow the market mechanism and to help these enterprises stand on their own feet soon. And to control the pollution from these enterprises is another task.

A recent study done by the World Bank showed that an often neglected polluting source is the township-and-village industrial enterprises. Instead of 15 to 20 percent, these TVIEs produce around half of the total pollutants in China.

Privatization is the suggested option from the World Bank to China to increase the performance of such enterprises and reduce the pollution.

IMPROVEMENT of LEGISLATION

To catch up with the demand of transition to market economy, China has been following the principle of market mechanism to make and upgrade its laws, including environmental laws. In this process, China has learned a lot from the US and other developed countries. But compared with these countries, China still has a long way to go.

The Solid Waste Management Law, adopted last year, includes articles of regulating solid wastes and hazardous solid wastes production and disposal. But the law is too general and only includes principles. To implement the law, the State Council has to make

some specific procedures. One year after the adoption of the law, procedures have not been made yet.

Another law adopted last year is the amended Air Pollution Control Law. There are some specific regulations about the acid rain. Nearly 30 percent of China's territory is included in the designated areas to control the acid rain. Standards on de-sulfurization are being made.

To meet those standards, industries and power plants will have to spend huge amount of money to control SO₂. Obviously, appropriate technologies will be needed. Some Japanese technology of de-sulfurization has been imported to China, but the costs amount to almost one-third of total investment of a new power plant.

According to Dr. Qu, 20 percent might be an acceptable level for a power plant to install the de-sulfurization facility.

PUBLIC PARTICIPATION

Not long ago, Water Pollution Control Law was adopted in China, which contains one clause that in the process of EIA public participation is required.

The criticisms and suggestions from the public have been very well taken in China, said Dr. Qu. His Committee at the National People's Congress has been organizing an activity "All-China Trans-Century Environmental Tour," in the last four years. It is aimed at exposing polluters to the public through media, especially TV and newspaper.

The Huai River, which is now on national priority list, got the attention from the government as a result of a series TV coverage of the pollution along the river. More than 1,000 factories have been shut down, and many waste water treatment plants are being constructed.

Grass-roots environmental organizations are also shooting up in the country. These newly emerging NGOs, such as Friends of Nature, Global Village, PACE, are playing more and more important role in promoting China's environmental protection.

INTER-AGENCY COORDINATION

Like many other countries, coordination among governmental agencies in environmental policy making and implementation has been a major obstacle. In China, an environmental committee under the State Council has been set up to coordinate the activities of different sectoral ministries.

Those ministers meet once every three months to discuss latest problems. But reality shows such a committee is far from being enough to solve the major problems and conflicts among themselves.

In order to adopt more advanced technology, China has to rely on two sources. First is China's own research and development. And second is from other countries. At this point, said Dr. Qu, China has to mainly depend on the second source. In the industrial process, the most effective way to control pollution is to achieve cleaner production with less input of

materials and fuels and less output of wastes.

China, though with some of its own capacity, is lagging behind many developed countries in terms of environmental control technology. Learning from other countries's lessons and experience will help China leapfrog many prolonged stages in pollution reduction process.