TCL — China's No. 1 Color TV Manufacturer — Selects ON Semiconductor's Energy-Saving Chip; Mc44608 Device Reduces Standby Power Consumption By As Much As 90 Percent

9 January 2002

(BUSINESS WIRE) -- TCL Holdings Co. Ltd. has selected ON Semiconductor's (Nasdaq: ONNN) MC44608 device to enhance the power efficiency and reduce the standby consumption of its 25-inch and 29-inch color television (TV) sets.

TCL is one of the largest industrial enterprises in Guangdong Province, southern China, and maintains a leading position in the Chinese TV market. TCL is using ON Semiconductor's MC44608, a high-performance voltage-mode power controller IC.

This device contains a unique high-voltage start-up circuit that initiates power delivery but subsequently turns off to conserve power during normal TV operation. When the TV is switched off, with remote control or manually, the MC44608 enters a highly efficient "pulsed mode" of operation, providing standby power for the TV's memory system.

This device and the entire MC44608 family of devices from ON Semiconductor help reduce TV standby power consumption to approximately 1 watt -- complying with international conversation standard. Most domestic color TVs produced in China consume 15 watts of power in standby mode. With the MC44608 device family, standby power consumption is reduced by 90 percent or more.

"ON Semiconductor's MC44608 device enhances the power efficiency of our 25-inch and 29-inch color TVs, and brings the standby power consumption to the minimum," said Yang Fu Zhong, vice president of Multimedia Electronics Research & Development Center at TCL.

"This not only contributes to conserving energy, it also strengthens the brand value of TCL color TVs and advances our product design to a new level."

"Electricity leaking from TVs and other home appliances is an increasingly critical phenomenon to be addressed," said Mike Heitzman, ON Semiconductor Analog and Power Management Business Group general manager. "For example, TVs alone cost Americans more than $750 million annually in standby power losses.

"ON Semiconductor continues to provide power management chips that will reduce the standby power consumption while making the end product more efficient, with the MC44608 family being a leading example for TV applications. TCL's decision to use our energy-saving device provides value-added service to their color TV consumers.

"It also reinforces their competitive strategy to develop the best products and provide the best service."

The MC44608

The MC44608 is a high-performance voltage mode controller designed for off-line, wall-plug based power conversion. It requires few external components while offering high flexibility and reliability. The MC44608 device features novel pulsed-mode operation circuitry targeted at high-efficiency power conversion.

The device enables reduction of total standby power consumption to approximately 1 watt, while delivering up to 150 watts during normal operation.

About TCL Holdings

TCL is one of the most valuable brand names in China. Since its establishment 20 years ago, the company has grown into a leading enterprise manufacturing four main categories of products: home appliances, IT, telecommunication and electronics. Its TVs are especially popular with the sales of TCL Superior TVs accounting for 5 percent of the world's total.

Apart from its presence in China, TCL also has branch offices in Vietnam, India, Indonesia, Singapore, the Philippines, Russia and the United States. For moreinformation, visit TCL's Web site at http://www.tcl.com

About ON Semiconductor

ON Semiconductor offers an extensive portfolio of power- and data-management semiconductors that address the design needs of today's sophisticated electronic products, appliances and automobiles. For more information visit ON Semiconductor's Web site at http://www.onsemi.com

Legislation Needed to Regulate Waste Domestic Appliances

EHS Review
December 2001

The State Economic and Trade Commission (SETC) has reported that currently 0.12 billion refrigerators, 0.17 billion washing machines, and 0.4 billion TV sets and 16 million computers are now owned in China. However, most of refrigerators, washing machines and TV sets were manufactured in the 1980s or early 1990s and according to the SETC, should now be out of use. The over or prolonged use of domestic appliances impose environmental, health and safety risks. With this in mind SETC is urging the drafting of a management regulation for waste domestic appliance recycling.

It is suggested that the regulation should cover:
- Development of abandonment standards for domestic appliances;
- Establishment of recycling channels; and,
- Establishment of a fee collection system for recycling.

An Energy Efficiency Labeling System will be Established Next Year

14 November 2001

To enhance the legal and supervisory systems of energy efficiency labeling in China, a regulation on "Energy Efficiency labeling Implementation and Management Approaches" will be published next year. China will then officially adopt the Energy Efficiency Labeling System. The proposed adoption of a labeling system was announced at the International Workshop on Energy Efficiency Standards and Labeling in November 2001.

Energy efficiency labels enable consumers to know both the energy consumption and the energy efficiency grade of energy consuming products. The labels provide consumers with information that is easy to understand and that can help them choose products that are energy efficient and that are cheap to run.

An official from the State Economic and Trade Commission announced that the establishment and implementation of an energy efficiency labeling system is a substantial measure to saving energy in China. The establishment of a labeling system marks the change in government energy saving management techniques from a centrally planned system toward one directed by the market. Labeling practices in the US and Japan show that an energy efficiency labeling system is an efficient approach to successfully managing energy saving, improving energy efficiency, and regulating energy consuming products.

Beijing Warms to Clean Energy

19 November 2001

Some 60 per cent of boilers in Beijing now use clean energies such as natural gas and electricity to produce heat, according to officials.

Guo Weiqi, an official with the municipal management committee, said in a phone interview that there are still at least 5,000 small-sized boilers using coal for heating in the city.

"All boilers will use clean fuel in 2008 as planned," he added.

Burning coal for heating in the winter has long been a problem since it causes serious air pollution. Before 1997, Beijing consumed 28 million tons of coal each year, which produced 90 per cent of the sulphur dioxide and 50 per cent of the floating particles in the air, according to official statistics.

The municipal government has required all eight of Beijing's urban districts to use cleaner fuel to ensure a green Olympics in 2008.

Chen Ming, deputy manager-in-general of the Beijing Heating and Power Group, said that a clean-fuelled central heating system will help curb the capital city's pollution problems.

The group, which provides half of the city's heating, owns four heating factories - all of which use clean fuels. The rest of the city is heated with smaller, sometimes individual, heating systems.

"These can be dated back to the earlier days, when building designs did not consider central heating or pollution. It leaves problems for us now to build pipelines to send central heating inside," said Zhang Dongxue who works with the group.

Another problem is the hutong. Chen Ming said that building pipelines in hutongs would spoil the appearance of these historical and cultural symbols.

Chen suggested that using electricity is a better solution for residents living in single-storey houses there.

"Various kinds of clean energy will play important roles in heating systems in the future," Chen predicted.

He added that the central heating system will also develop towards providing air conditioning in the summer and helping produce electricity in the spring and autumn.

The Ministry of Construction Announces the Implementation of the Transition (Hot-Summer Cold-Winter) Zone Building Code

China Construction News
17 January 2002

Mr. Wang Guangtao, Minister of the Ministry of Construction, stated that the enforcement of a transition zone building code would lead to a substantial carbon reduction.

The transition zone or the so-called Hot-Summer-and-Cold-Winter Zone covers 16 provinces, autonomous regions, and municipalities across central China in the region of the Yangtze River. This region is well-known for its dense population (550 million) and its highly developed economy with a GDP contribution of around 48%.

In November 2001, the following four government organizations jointly announced the adoption of the code: the Ministry of Construction, the State Economic and Trade Commission, the State Development and Planning Commission, and the Ministry of Finance. These government organizations expect that the implementation of the code will save 50% of the energy used in buildings.

The 863 Program and Electric Drive Vehicles in China

30 September 2001

Today, at a conference held by the Ministry of Science and Technology (MOST), experts approved the Electric Drive Vehicle Project, a key component of the Tenth Five-Year Plan's National 863 Program. The approval of this project will have a substantial impact on the development of the automobile industry in China.

As China's economy expands, the nation's automobile industry—increasingly one of the main consumer commodities—has an opportunity to develop. However, the development of the vehicle industry has both negatively affected the environment and placed a strain on oil supplies. The development of electric drive vehicles will reduce the negative impacts of an increasing car fleet.

Nowadays, electric drive vehicles such as pure battery, hybrid, and fuel cell vehicles based on hydrogen fuels combine various kinds of new advanced technologies. These electric drive vehicles have caused a worldwide revolution in the vehicle industry. Over the past decade, the US, Japan, some European countries, and some multinational companies have invested more than a total of 10 billion dollars to electric drive vehicle development, and will continue to invest at least 1 billion dollars annually. In China, the research and development of electric drive vehicles began during the Eighth Five-Year Plan. The industry has made some concrete achievements in research and development and is now in the process of marketing some components of electric drive vehicles.

According to Dr. Wan Gang, the Chief Scientist of the 863 Program's Electric Drive Vehicle Project, the development level of electric drive vehicles in China is only 4-5 years behind that of western countries, while traditional internal combustion engines are 20 years behind. Therefore, the further development of advanced vehicles will help China become more competitive in the international market. Compared with traditional vehicles, the electric drive vehicle industry around the world has not yet matured. In contrast, the traditional vehicle industries and the corresponding infrastructure of developed countries have developed well, which may create barriers to social innovation for electric drive vehicles. This provides China the opportunity to compete with developed countries in the auto industry by developing electric drive vehicles.

Academics and experts in the field of vehicles, machinery, materials, batteries, and control as well as managers of automobile enterprises participated in the meeting.

China Develops High-Performance Electric Car: A high-performance electric car made debut

Sinoprojects.com, ISSUE No.71
19 December 2001

A Company in east China's Anhui Province has announced that it has developed a high-performance electric car, whose major technical features have reached or surpassed that of similar overseas products.

Guo Defa, manager of the Zhaocheng Electric Vehicle Technology Co., said the car is capable of carrying four people and traveling up to 80 km per hour for a maximum of 273 km.

The car consumes 15 kilowatt hours of electricity per 100 km and has a maximum climbing capacity of 18 degrees, said the manager.

He said three decades of research and development on the electric vehicle has enabled the company to acquire the basic technology, such as its lead-acid power storage battery and special drive engine.

The manager said the battery is as good as the best similar overseas products in terms of energy efficiency and recycling potential, adding that 95 percent of the battery can be recycled.

The car was developed in cooperation with other Automobile Groups and universities

The electric car, or model ZC 7050 A, was developed in cooperation with Qirui Automobile Co. of the Shanghai Automobile Group Co.

The car will cost 110,000 yuan (13,400 U.S. dollars) but the price will be lowered to about 10,000 U.S. dollars with mass production, the manager said.

The price is much lower than that of other electric cars developed in China and overseas, which use much more expensive nickel-hydrogen and lithium storage batteries.

China's major car producer Dongfeng Automobile Group Co. unveiled its first concept of the electric car earlier this year in cooperation with the Chinese Academy of Sciences and some universities.

New Energy Source Fuels Industry

14 January 2002

China is approaching advanced techniques in producing environmentally friendly energy devices.

The fuel cell is highly efficient and pollution-free and is believed to be an ideal energy device for electrically operated cars. The device, with fuel stored in an external tank, converts fuel such as hydrogen, methane and propane directly into electricity with about 60 to 70 per cent efficiency.

The world's leading car manufacturers have made research and development of electric motor vehicles driven by fuel cells their goal.

Experts believe the international automobile market will be redistributed in the next 10 years, which might be the only opportunity for China's automobile industry to catch up with and surpass the world.

"The country has approached the world's most advanced techniques in producing fuel cells through 20 years of research and development," said Zhou Zhengxiang, vice-director of China Battery Industry Association.

China plans to invest 1 billion yuan (US$120 million) in research of electric automobiles driven by fuel cells, Zhou said.

However, fuel cells cannot be widely used in cars during the 10th Five-Year Plan period (2001-05), due to high costs and difficulties in building supporting facilities, Zhou added.

China now has more than 20 institutes and enterprises specializing in fuel cells, compared with over 700 in the world, said Shen Peikang, an expert with Zhongshan University.

"The utilization of fuel cells ranges from small electronic components to electric power plants," Shen said.

He believes that the country now has a large potential market for small-sized fuel cells.

According to the battery association's statistics, China produced 17 billion dry batteries last year, with a domestic market demand of over 8 billion.

"It is a huge market, if fuel cells could replace a small part of the dry battery market," Shen said. "Small-sized fuel cells theoretically can be used in electric bicycles, mobile phones and many other small electrical appliance."

The annual consumption of electric bicycles in the country is 100,000, while traditional bicycles number in the hundreds of millions. Shen predicted that the consumption of electric ones will increase to 10 million, if the price is reasonable and performance is good.

"The production of small-sized fuel cells will be commercialized in the following one to two years in China," Shen said.

Ming Pingwen agrees. As general manager of Sunrise Power, China's first listed company devoted to mass production of fuel cells with a total assets of 50 million yuan (US$6.04 million), his company could now manufacture fuel cells for electric bicycles and mobile power supplies. It is expected to mass produce in two years.

China now has four fuel cell enterprises, which have produced four types of electric cars driven by fuel cells so far.

But fuel cell development needs much government investment, Shen added, citing a plan by the Shanghai municipal government to invest 100 million yuan (US$12 million) per year in supporting the research and development of fuel cells.

China Announces New Investment in Auto Fuel Cell Development

17 January 2002

Chinese scientists have begun a three-year development of fuel cell technology, which will provide the most effective and safe alternative of traditional energy for the automotive industry.

According to the Chinese Academy of Sciences (CAS), China's top research body, the state is expected to invest more than 100 million yuan (12 million U.S. dollars) in developing the proton exchange membrane fuel cell (PEMFC) technology, which is also a sub-project of the state's high-technology advancement program.

Researchers from the CAS Dalian Institute of Chemical Physics are scheduled to focus on research and development of fuel cell systems with a generating power of 75 kilowatts and 150 kilowatts, respectively.

Transforming chemical power of hydrogen and oxygen into electric power, fuel cell has high generating effectiveness and almost produces no pollutant to the environment, scientists say.

High power fuel cells could be widely used in space shuttles, submarines, underwater robots, electric vehicles, power plants, movable power supplies and communications appliances, said Zhang Huamin, chief executive officer of the high technology project.

At a news conference held here Thursday afternoon, CAS President Lu Yongxiang said that his academy should make basic and strategic contribution to the country's economic growth and sustained development. According to the CAS plan in the coming five years, successful research and development of fuel cell technology might show its high-level technological integration ability.
Closely cooperating with other CAS institutes, prestigious universities such as

(Continued on next page)

FAR EASTERN ECONOMIC REVIEW

King of The Road

A boring old bus company has polished its image, enhanced its services and embraced technology to emerge as a model for transport operators in the region

By Jonathan Finer/HONG KONG
February 07, 2002

WHEN JOHN CHAN took over as managing director of Kowloon Motor Bus in 1993, he looked across the harbour and saw a nightmare vision of what his company could become. China Motor Bus, KMB's counterpart over the water, was showing signs of collapse. Its shoddy services and dilapidated fleet were raising the ire of government regulators and commuters alike.

The gradual demise of CMB, which lost its government franchise in 1998, was a wake-up call for Hong Kong's only other major bus company. The two giants that had brought public-bus transport to Hong Kong in 1933 had long lorded over separate districts. KMB controlled virtually all bus routes on the Kowloon peninsula and through the fast-growing New Territories, while CMB dominated Hong Kong island.

Little competition meant there was no real incentive to improve quality, and services were widely criticized. Upon taking the reins, Chan found a company that was stuck in the past, unwilling to make improvements or adopt new ideas. "Then we saw what was happening at CMB," says Chan. "And we knew we had to change. The writing was on the wall."

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Investment in Fuel Cell (continued)

Qinghua and Zhejiang as well as Dongfeng Automobile Company and Shanghai Automobile Group, the Dalian institute plans to complete the research project in the three years.

Zhang said that a few of developed countries including Canada and Japan have yet to industrialize the fuel cell technology. The research endeavor of Chinese scientists and technologists in the field could make China follow up the world's latest trends in using clean new energy of hydrogen.

Zhang said that environment-friendly vehicles powered by the fuel cell are expected to serve the 2008 Beijing Olympics.

In 1970s, the Dalian institute invented two types of fuel cell used by space shuttles. It began the study on the PEMFC technology during the period of China's ninth five-year national social and economic development plan (1996-2000).

China Online

China to Invest US$24B in Subways

(21 January 2002)

China will invest 200 billion yuan (US$24.2 billion) in subway construction from 2001 to 2005, a quarter of the 800 billion yuan (US$96.6 billion) earmarked for urban-transit construction during its 10th Five-Year Plan.

A total of 450 kilometers (281 miles) of urban railways will be completed, according to the Subway and Light Rail Research Center under the Ministry of Construction.

A train pulls into a Beijing subway station.

Among the 34 cities with a population over 1 million, 20 cities are either planning or building a rail-transit network. Beijing, Shanghai and Guangzhou are expanding their networks, according to a Jan. 18 Renmin Ribao (People's Daily) story.

Beijing has 54 kilometers (33.75 miles) of subway lines in operation. It started building a 27.7-kilometer (17.3 miles) new line last July. The city aims for 408 kilometers (255 miles) in total subway length in the long term.

Shanghai has three subway lines in operation. Between 2001 and 2005 the city plans10 rail lines—including magnetic-suspension rails, light rails and subways—that total more than 200 kilometers (125 miles) in length.

Shanghai is also aiming for 11 subway lines with a total length of 384 kilometers (240 miles) in the long run.

In Guangzhou, the No. 1 subway line, 18.49 kilometers (11.56 miles) in length, was put into use in June 1999.

Construction of the 23-kilometer (14.38-mile) No. 2 line is underway and scheduled to be completed by 2003, and the No. 3 line will be completed by 2005. The No. 4 and No. 5 lines are in the planning stages.

By 2010, a 130-kilometer (81.25-mile) rail-transit network will take shape in Guangzhou.

In addition, Shenzhen and Nanjing have also started subway construction. Xi'an, Shenyang, Chengdu, Dalian, Qingdao, Harbin, Zhengzhou, Tianjin, Changchun, Chongqingand Wuhan are planning to build either subways or light-rail transits.

Each kilometer (0.625 mile) of the subways built in Beijing, Shanghai and Guangzhou in recent years costs between 600 million yuan (US$72.46 million) and 800 million yuan (US$96.62 million) on average.

King of the Road (continued)

And change it has. This tradition-steeped bus company is now viewed by many in the industry as an innovator for the way it has embraced new technology, enhanced its services and polished its image.

No longer a slumbering giant, KMB has emerged as a model for transport companies in Asia, where a third of all people live in cities choked by pollution and congested roads. Considering that by 2020, Asia's urban population will double to 2.5 billion, an effective public-transport system is a matter of social and economic survival for many countries in the region. The Asian Development Bank estimates that to deal with the crush, these countries must spend more than $3 trillion on urban infrastructure, of which transport systems will comprise a major part.

While bus operators elsewhere in the region, such as the Bangkok Mass Transit Authority, have grabbed headlines in recent years for safety concerns and declining profits, KMB has fared better. It has maintained a low accident rate, despite its fleet size of more than 4,000 vehicles making three million daily passenger trips, and has become an integral part of Hong Kong's transport system, believed by many to be among the world's best. "The model is remarkably efficient," says Sharon Cullinane, a professor at Hong Kong University's urban-planning centre and a public-transport expert who has studied transport systems the world over. "It has everything you could want from a bus system."

It makes money, too. KMB's earnings per share have grown at roughly 14% per year since 1995, and in the last 10 months alone, its share price has doubled to around $33.

For Chan, the lesson of CMB's demise was that after 60 years in business, KMB needed to stop taking its monopoly status for granted and start competing for both its route franchise and passengers. He watched the government gradually strip routes from CMB. By 1998, when CMB lost its franchise, Hong Kong had five franchised bus operators, including two, Citybus and New World First Bus, which competed directly on Hong Kong island.

"Bus companies looked at what we were doing [to CMB] and said, 'This could happen to any of us'," says Liza Wong, Hong Kong's assistant transport commissioner for bus and railway. "Now the threat of competition keeps them on their toes."

KMB had an image problem that needed to be changed. "We had this attitude that we would provide a service and the passengers would take it whether they liked it or not," admits Chan. "But we started thinking of passengers as customers who were free to choose from a range of transport options."

The first step KMB took was to ask customers what they thought about its services. The company conducted surveys and held regular feedback meetings

between passengers and staff-something that is now a government requirement for all Hong Kong bus companies.

The response was loud and clear: Customers demanded timeliness and reliability, they cared about pollution and wanted courteous-not surly-drivers. KMB responded by installing low-polluting engines on most of its fleet, and sending its drivers on customer-relations courses. It worked: KMB's own market surveys indicate customers are happier since the changes have been made.

Other new developments have included Internet-equipped bus shelters, or cyber bus stops, where passengers can use computer terminals to get route, timetable and fare information from the company's home page.

And in a change that speaks volumes about the lack of competition in the industry over the years, in 1996 KMB became the first bus company in Hong Kong to launch an advertising campaign. The campaign was designed to tell the public about the improvements the company was making. "They made a lot of important changes to develop a more modern image," says Kingston Lee, director of Schroder Investment Management in Hong Kong.

But image was only part of the problem. Hong Kong was just too small. By the late 1990s, KMB had expanded into nearly every available route in the territory, and needed new sources of revenue for continued growth. "Hong Kong had become a saturated bus market," says Lee. "KMB was under pressure to expand outside of its core."

Once again, Chan looked out from his Kowloon vantage point. This time, he looked north, to mainland China, where a number of Hong Kong companies were expanding their operations. He took KMB's buses there in a joint venture in the northeast coastal city of Dalian in 1997, followed by a second in 1999 in Tianjin, also in the northeast.

For now, mainland business represents just a tiny fraction of KMB's overall revenue, but further forays are planned in Beijing, Shanghai and Chengdu, according to Winnie Ng, KMB executive director and point-person for new projects.

The regulatory environment for transport companies in China can be a minefield, but there is reason to persevere. In a country with 500 million bicycles and a minuscule rate of car ownership, the market for effective public transport is almost unlimited. "In the long term," says Chan, "this is where our corporate growth will come from."

Not content with expanding its primary business, KMB has also diversified into new areas. Building on its already profitable bus-body advertising enterprise, KMB developed Roadshow, a televised entertainment and advertising platform on board its buses. Last year, it was spun off from KMB and is now listed separately on the Hong Kong Stock Exchange. The venture has made KMB a major media-sales outlet in the region (see story on page 40).

KMB has pursued these new avenues while retaining its hold on Hong Kong's bus-transport market. Still without real competition on most of its Kowloon routes, KMB operates 28% of all passenger trips on Hong Kong's public-transport

(Continued on next page)

King of the Road (continued)

network, more than the four other Hong Kong bus companies combined. "If someone tried to compete directly with them, I am not sure what they could do better," says Lyndon Rees, managing director of Citybus, which operates routes on Hong Kong island. "KMB has been very smart."

The real competition comes from other forms of transport. In the next 15 years, the government will pour some HK$200 million into making railways "the backbone of the territory's transport infrastructure," according to the Transport Department's Wong. But KMB's ridership has held steady since 1997, while traffic on the Mass-Transit Railway, Hong Kong's subway, has dropped by 1%-2% per year. Edmund Ho, KMB's financial director, believes that the development of new rail lines will provide KMB with opportunities for growth. "The new railroads will need bus links and that will create business for us," says Ho. "We can adjust."

What's good for KMB is good for Hong Kong, too. In many ways, the territory is tailor-made for public transport. It has a high population density and a car penetration of only 15%. The relationship between vigilant transport authorities and well-run private companies is now winning the attention of other cities.

In Singapore, long Asia's transport standard-bearer and ranked just ahead of Hong Kong in a recent study of infrastructure leaders by Hong Kong-based Political and Economic Risk Consultancy, SBS Transit is following KMB's lead by seeking passenger feedback. Several other Singapore companies are developing on-board media platforms. And the Singapore government last year echoed Hong Kong's strategy by transferring several of SBS's routes to a competitor.

"Of course, there are some regulations we think we could do without," says Chan, who laments the need to apply for every schedule or routing change. "But overall, the government has found a solution that works for others to emulate." It helps when one of the city's near monopolies doesn't always act like one.

Beijing Olympics to Rely on Solar Energy

25 February 2002

Solar energy will be the principal energy source for the 2008 Beijing Olympic Games with solar batteries attached to the external walls of the Olympic gyms and stadiums.

Solar energy will provide power to 80 percent to 90 percent of streetlights around the gyms and stadiums and heat up 90 percent of the hot water to be used during the Games, Beijing Chenbao (Beijing Morning Post) reported on Feb. 22.

The Ministry of Science and Technology (MOST) and the Beijing municipal government will start construction of a 30-kilowatt showcase photovoltaic-power station next year, which will provide electricity to the lighting and air-conditioning in some gyms and stadiums, the newspaper quoted an MOST official as saying.

By 2008, clean fuel will be used on 90 percent of public-transit vehicles and all taxies, city-sanitation vehicles and postal-service vehicles, said the newspaper.

In a separate report, Guo Junqing, deputy director of the Beijing Development Planning Commission, said that high-quality, clean energy such as natural gas and electric power will make up over 80 percent of Beijing's energy consumption in 2008.

Beijing will control the proportion of coal and coke in energy consumption below 20 percent and that in fuel consumption around 48 percent.

Beijing will reduce its coal consumption from 27 millions in 2000 to 15 million tons in 2008, with about 8.5 million tons of coals used as fuel in urban areas, a Feb. 21 Xinhuashe (Xinhua News Agency) quoted Guo as saying.

Beijing is one of the world's super-large cities using fire coal as a major energy source, and direct burning of large amount of raw coal along with a coal-based energy structure constitutes a major source of Beijing's severe air pollution.

It is predicted that a large number of coal enterprises in Beijing will quit the business in the next few years, and over 95 percent of these enterprises' employees will take jobs in real estate, property management and other areas of the service industry.

China Environmental Review
Environmental business intelligence for China

Environmental Performance Standards for Power Plants

11 November 2001

According to the State Environmental Protection Administration (SEPA) http://www.zhb.gov.cn/english/ officials, China is conducting pilot projects in Shandong, Zhejiang and Shanxi provinces with the aim of developing nationwide power plant performance standards. Currently, the emission standards for power plants are based on limits on concentrations of pollutants. According to SEPA, the new performance standards would be designed to control environmental pollution by power plants through maximum emissions limits based upon the amount of electricity produced by the plant. SEPA officials further note that if the pilot projects in the three provinces achieve "positive results," China will implement the new power plant performance standards nationwide by the mid 2000s.

Chinese Planning Minister on Restructured Power System, Farm Incomes

March 7, 2002

Beijing, 7 March: Zeng Peiyan, minister in charge of the State Planning Commission, said here today that the government has finished drawing up a plan for restructuring the power supply system and the plan will soon be promulgated for implementation.

He made this statement when the spokesman for the fifth session of the Ninth National People's Congress NPC requested him to answer a reporter's question about China's economic situation.

Zeng Peiyan said: The principle for restructuring the monopoly industries in the country is to separate the government from enterprises, put an end to the monopoly, optimize the use of resources, and tighten the supervision. When this principle is applied in the restructuring of the power supply system, it means power plants will be separated from power grids and those plants that offer good power prices will be licensed to supply electricity through the power grids. The main thing to do to separate power plants and power supply grids is to separate the power sources and power grids managed by state power companies and to form the power generating enterprises into several power groups. Zeng Peiyan said: Soon, power plants will be licensed to supply electric power on the basis that they offer competitive prices. This means that those power plants that provide clean electricity at low prices and can do a good job in protecting the environment will be licensed to supply electricity. To make sure that power plants can compete in the market in an orderly manner, the government will form a power supervision committee to tighten the supervision over the market.

Economic Outcome Beyond Prediction

Xie Ye
8 March 2002

China's better-than-expected economic performance in January and February indicated that the country is capable of meeting its growth target this year, China's top economic planner said yesterday. Zeng Peiyan, minister of the State Development Planning Commission, said: "The overall economic situation is better than we had predicted. The GDP (gross domestic product) growth rate for the first two months has remained at 7 per cent. As China's economy tends to accelerate in following months, I think our all-year growth target of 7 per cent is attainable."

At yesterday's press conference for the Fifth Session of the Ninth National People's Congress, Zeng also unveiled the long-awaited reform plan for the power sector. This aims to break up the virtual monopoly of the State Power Corporation of China.

Zeng said the government plans to separate the electricity-generating and transmission assets of the corporation, which controls more than half of China's power plants and almost all the power grids. Most of the company's generating assets will be injected into three or four new power-generation groups to let them compete across the nation.

The power-transmission assets of the State Power Corporation are expected to be split into five regional grid companies, in which the State Power Corporation will hold the controlling shares. Another independent grid company would be set up to cover the southern provinces.

Zeng said all the power plants should compete to transmit their electricity over power networks, and an independent committee would be set up to supervise the power sector.

"As for the current contracts with foreign companies, they could either keep their contracts unchanged or they could negotiate new ones," said Zeng.

To solve the electricity shortage in the 1980s, China promised each foreign investor in the domestic power sector a stable high profit return for 10 to 20 years.

Zeng admitted that China's entry to the World Trade Organization could be painful for less efficient industries such as motor manufacturing and pharmaceuticals, and also lead to an increased oversupply of grain and further joblessness.

"We should provide favourable policies and systems to protect our industries and agriculture, as the WTO rules allow," said Zeng.

"Compared with other WTO members, our support for agriculture is much less. We are very much justified in lending more support."

He added that China will seek to expand exports and imports to keep foreign trade balanced.

Power Reform Scheme was Approved by both the State Council and the Political Bureau in January 2002

Xiaolin Li

Chinese and western media reported around January 17th 2002 that the long-awaited power reform is to be announced soon. SONGBIN obtained insider 's report that the Political Bureau of the Central Committee of the Communist Party passed in principle the reform scheme on January 21st 2002. The whole reform will take at least one year since the approved scheme addresses only principle issues, while a lot of details need to be worked out later.

The electric power sector reform is to separate the generating and transmission assets of the monopolistic State Power Corporation and establish a southern grid company that will include Yunnan, Guizhou, Guangxi, Guangdong, and Hainan power networks. Sichuan and Chongqing networks will be merged onto Central China grid, which will eventually become one of the 5 (the other four are Northeast, North, Northwest, and East China) sub-SP companies rather than the current "branch" SP companies. Each of these grid companies will keep pump storage power stations and other emergency peakers as its generation assets. SP will keep full control of the Three Gorges hydropower station and its transmission lines. There will be no further separation of transmission and distribution during the 10th FYP period (2001-2005).

SP's power generation assets will be reformed into "three to four" power generation companies, each will not have more than 40 GW installation.

An electric power supervision committee will be established to monitor the market and maintain fair competition. SETC's Electric Power Administration Bureau may be merged into SETC's Department of Comprehensive Industries.

Power tariff will be decided and monitored by relevant government agencies for pricing. New power tariffs will have on-grid tariff, transmission and distribution tariff, and end usage tariff.

The approved reform scheme is aimed at encouraging competition in the industry so as to develop power industry, finance power projects, improve efficiency and lower power tariff. After the reform, SP will be scaled down substantially. As for how much the reform will affect its personnel, there are different observations, some said no big impact, some said personnel changes are expected.

SONGBIN has been asked to help out with detailed suggestions on internal institutional changes, financial arrangement, asset evaluation, and internal operation control, etc. Anticipated obstacles are in people's minds.

Restructuring Separates Power Generation, Transmission

21 January 2002

China plans to form two power giants—the Southern Power Company and the State Power Grid Co—this year to break up the State Power Corp.'s near-monopoly on the country's power supply.

A restructuring plan for the power industry will be announced soon, Hua Shang Bao (Chinese Business View) quoted an industry source as saying in a Jan. 18 report.

The Southern Power Co. will be formed through restructuring and integrating power companies in the provinces of Guangdong, Yunnan, Guizhou, Hainan and Guangxi. Guangdong will hold controlling shares in the new company.

The establishment of the Southern Power Co. will end the monopoly of the State Power Corp. in southern China and facilitate the transmission of electricity from the western to the eastern part, said the report.

Currently, Yunnan, Guizhou, Sichuan and Guangxi transmit a total of 7 billion kilowatt-hours of electricity to Guangdong each year, which is slated to increase to 40 billion kilowatt-hours—one fifth of Guangdong's electricity consumption—by 2005, to lower the prices of electricity in the province.

The existing SP Southern Power Co., a subsidiary of State Power currently responsible for coordinating the west-east power transmission, will be dissolved after the Southern Power Co. is set up.

After the restructuring, the State Power Grid Co. will be responsible for building power grid and the State Power Corp. the grid's operation and management.

The restructuring is also expected to focus on the separation of State Power's generating and transmission assets and transfer some of the generating assets to its Hong Kong-listed subsidiaries, Huaneng Power International and Beijing Datang Power Generation Co.

A Chinese worker peddles past water-cooling towers near an energy plant in Beijing.

State Power will have four subsidiaries after the restructuring: SP Power Generation Co., Beijing Datang Power Generation Co, Guohua Power Generation Co. and Huaneng Power International, each of which supplies power to a specific region, according to the report.

State Power Corp. and its subsidiaries currently control 150 gigawatts, or half of China's total, in installed capacity, the total manufacturer-related capacities of equipment such as turbines, generators, condensers, transformers and other system components.

Beijing Datang Power Generation Co. was founded on four power plants of State Powerís North China Group. Beijing Datang's generating facilities, located in Beijing, Tianjin and Tangshan, and has an installed capacity of 5.57 gigawatts.

Beijing Datang has 1.5 billion yuan (US$181.16 million) in cash, which is sufficient for acquiring power plants in two to three years, said the report.

Huaneng International has an installed capacity of 10.81 gigawatts, and its parent, Huaneng Group, 30 gigawatts.

SP Power Generation Co. will be formed on the basis of the listed SP Northeast Power Co., the report added without giving details.

Guohua Power Generation Co. is the only one among the four that is not listed. It has an installed capacity of 4.3 gigawatts.

Power suppliers will start bidding for use of the power grid in 2003, according to the report.

China was the world's second-largest power producer in 2000.

China Says Kyoto Pact Benefits Both Rich and Poor

Jonathan Ansfield
Reuters
18 January 2002

BEIJING - China, one of the world's worst polluters, yesterday pushed for early passage of the embattled Kyoto accord to curb global warming, calling it a win-win deal for industrialised and poorer countries alike.

The appeal came at a meeting of European and Asian environmental ministers, who are seeking to forge ahead with the Kyoto accord this year even without the United States, which abandoned the accord last March amid a chorus of criticism.

"China hopes all parties will continue to work hard to push for the Kyoto Protocol to go into effect at the earliest possible date," State Environmental Protection Administration Director Xie Zhenhua told the ministers in Beijing.

China would "actively explore" financial and technical aid deals under the accord's "Clean Development Mechanism", which allows industrialised nations to meet pollution control targets through projects in the developing world, Xie said.

"The Clean Development Mechanism...will spur sustainable development and provide win-win opportunities," he said.

The Kyoto pact aims to reduce gas emissions from factory smokestacks and exhaust pipes that many scientists say gather in the atmosphere trapping heat - the so-called greenhouse effect.

The 1997 pact was put in jeopardy last March when U.S. President George W. Bush backed out of the agreement, saying it would hurt the U.S. economy and reap only slim benefits.

But a last-ditch deal reached by environment and energy ministers from around the world in Morocco in November paved the way for bringing the pact into force by late this year even without the United States, the planet's biggest polluter.

Japan, said to hold the swing vote in bringing it into force, plans to submit legislation to ratify the pact at a parliament session this month.

The pact commits the world's industrialised countries to cut their greenhouse gas

(Continued on next page)

China Offers Lukewarm Response to Bush on Climate

Reuters
18 February 2002

BEIJING - China, one of the world's biggest polluters, gave a tepid response last week to George W. Bush's plan to combat climate change, instead voicing support for the Kyoto treaty that has been rejected by the U.S. president.

Bush last week put forward a voluntary plan for U.S. companies to cut greenhouse gas emissions and other harmful pollutants from power plants and industrial sources.

A Chinese foreign ministry spokesman made no direct comment on Bush's plan, but said Beijing was still pursuing the Kyoto treaty and called on developed countries to take the lead in cutting emissions blamed by many scientists for causing global warming.

"We think developed countries have the obligation to take the lead in reducing greenhouse gas emissions because they are the main greenhouse gas emitters in the past and now," Foreign Ministry spokesman Kong Quan said in a statement.

China has been pushing for early passage of the embattled Kyoto accord to curb global warming, saying it would help industrial and poor countries alike.

"Developing countries, including China, are all victims of climate change," he said, but added poor nations were preoccupied with building their economies and eliminating poverty.

China had made an effort to cut greenhouse emissions while building its economy, and was studying the Kyoto treaty and would try to approve it as soon as possible, Kong said.

"China is willing to strengthen cooperation with all countries on climate change under the U.N. Climate Change Frame Treaty and Kyoto Treaty," he said.

China is among a large group of developing nations not required to meet the emissions caps contained in the Kyoto Protocol before 2012.

U.S. PULLS OUT

Last March, the United States pulled out of the 1997 United Nations anti-pollution treaty, signed by Bush's predecessor Bill Clinton, saying it would harm the economy.

The accord has been signed by more than 180 countries, the United Nations says.

China spews an estimated 11 percent of the world's carbon emissions into the atmosphere, while the United States emits about one quarter of the world's man-made "greenhouse gases".

Premier Zhu Rongji has spearheaded Beijing's campaign to balance breakneck economic growth with sound environmental policy, boosting awareness of the country's smog-filled skies and sludge-bound rivers.

The State Council in January approved a plan to spend some 65 billion yuan ($7.85 billion) on cleaning up and set strict pollution control targets in the five years to 2005.

Still, critics are sceptical China can transform industrial polluters like illegal coal mines that employ impoverished migrants and rural families.

Asia Keen on Bush-Backed Emissions Credits Trade

Jonathan Landreth
Reuters
15 February 2002

SINGAPORE - Power companies in Asia are hoping a new anti-global warming plan due yesterday from U.S. President George Bush will include support for emissions credit trading that could help fund cleaner energy across the region.

Small regional power companies now are counting on Bush to support emissions credit trade so they can secure financing for clean power plants in Thailand, Malaysia, and the Philippines.

Without the United States as a customer, earning money from what amounts to selling clean air may remain a dream.

"Right now, the notion of emissions credit trading is barely alive because of the non-participation of the U.S.," said Thawat Watanatada, president of AT Biopower in Bangkok.

Watanatada is eyeing potential earnings of $24 million over 13 years from emissions credits produced by five biomass power plants AT Biopower is planning to build in Thailand this year.

So far, AT Biopower's main funding is from Rolls Royce Power Ventures, a London-based leader in small power plant development, and Al Tayyar Energy, a Moroccan renewable energy firm.

Without the emission credits to help secure additional funds for cleaner energy, Thailand will continue to produce the kind of dirty power found in the West, Watanatada said.

"With U.S. participation, emissions credit trade imagined in Kyoto will have real teeth. Without it, we are more likely to repeat their mistakes." he said.

BUSH REJECTED KYOTO

Under the emissions credit trading proposed at the 1997 Kyoto climate talks, big energy companies will receive credits for the amount of carbon dioxide - the main gas capped at Kyoto - which they would otherwise emit via dirtier energy sources in return for investing in renewable power projects in developing countries.

The Kyoto treaty binds industrial countries to cut greenhouse gas emissions by about five percent of 1990 levels by 2012. Bush said emissions cuts would be too costly, and too many developing nations like China and India were exempt.

His rejection stirred global anger at the U.S., the world's No. 1 polluter, for not doing more to slow global warming.

Sceptics fear early entrants into emissions credit trading might sacrifice long-term power efficiency for short-term profit.

"Carbon trades will accelerate the transfer of efficient technologies," said Rob Watson of the Natural Resources Defence Council (NRDC), an environmental watchdog group in New York.

"But the plants which earn a lot of carbon emissions credits in year one might forego the costly boiler replacement crucial to the longer-term efficiency and savings," said

(Continued on next page)

Kyoto Pact Benefits (continued)

emissions, particularly carbon dioxide, by an average of five percent of 1990 levels by late 2002.

KYOTO'S MUTUAL INCENTIVES

China - which spews an estimated 11 percent of the world's carbon emissions into the atmosphere, compared to 18 percent by the United States - is among a large group of developing nations not required to meet the emissions caps before 2012.

The bilateral projects Beijing planned to explore under Kyoto in the future carried mutual incentives for China and its industrialised partners, according to Xie.

"The Clean Development Mechanism can allow developed nations to realise part of their pledge to reduce emissions at a price far lower than their domestic cost," he said.

Premier Zhu Rongji has spearheaded Beijing's public relations campaign to balance the economic juggernaut's breakneck growth with sound environmental policy, and awareness of the country's sooty skies and sludge-filled rivers has surged.

The State Council, or cabinet, last week approved a plan to spend 65 billion yuan ($7.85 billion) on cleaning up and set strict control targets in the five years to 2005.

Scepticism abounds over China's ability to transform its industrial polluters like illegal, unsafe coal mines that feed impoverished migrants and their rural families.

While Asia's star economy has embraced Kyoto as an instrument to bolster its competitiveness, China has backed off mechanisms that could cap pollutant levels and constrain growth.

Developing countries like China will have to adopt some form of emissions controls if they want to take part in the CDM projects, a top Japanese official attending the talks said.

"There has been some apprehension and scepticism if China would be interested in that kind of mechanism," said Seiji Morimoto, an official at Japan's Ministry of Foreign Affairs.

"But today the reaction by the Chinese side was rather positive and we on the whole felt very impressed," he said.

Since the U.S. withdrawal, having Japan - the world's second biggest economy and a major polluter - on board was seen as essential to bring the pact into force.

Morimoto said Tokyo's hopes to ratify the pact at a parliamentary session which opens next week were on track.

"Hopefully we will be able to finish all the necessary procedures in due course," he said.

The Korea Times Opinion

Energy Efficiency in China

By Choi Yearn-hong
9 February 2002

Woodrow Wilson Center, Washington, D.C.---China is a developing, but superpower nation, drawing greater attentions from the United States. Its energy and environment policies and management have been becoming subjects for scholarly discussions in Washington, D.C. Its superpower status is the reason. Energy efficiency is an important part of energy and environment policies. I have been surprised to know that the US government, the World Bank and NGO support for China's energy efficiency are truly remarkable.

China's expanding economy will create both challenges and opportunities for further increases in energy efficiency. We can learn energy efficiency from China. I can report to the Korea Times readers the scholarly seminar on China's energy efficiency, because our own energy-poor nation needs to make the most efficient use of its resources in that respect

Compared to other developing nations, China has led the pack as far as efficient energy use is concerned. Energy intensity, calculated as the primary commercial energy consumption per unit of GDP, has fallen roughly 50 percent between 1980 and 1995. This nearly 4.5 percent drop in energy consumption per year is unprecedented among industrializing economies. Much of the credit for China's unusually low energy intensity can be attributed to central government's policies. Since the early 1980s, improving energy efficiency has been a policy priority, and therefore has been incorporated into all of the five-year plans.

In a recent attempt to strengthen energy efficiency policy, the Chinese central government introduced the National Energy Conservation Law in 1998, which has been backed by significant funding. Recognizing the importance of energy conservation in light of a growing car-hungry middle class, the government allocated $100 million (USD) for alternative vehicle research and development. The Chinese government also has undertaken numerous cooperative energy efficiency projects with foreign governments, nongovernmental and multinational organizations.

While the Chinese government has promoted the development of a greater energy efficient economy, some of the success is more accurately a symptom of changing economics. Many observers contend that a shift in demand, driven by a changing product mix, accounts for almost two-thirds of the drop in energy intensity (or increase in energy efficiency). Technology changes, unrelated to government policy, also likely have made a substantive contribution. Whether a result of intended or unintended actions, the energy situation in China could be far worse. Had the ratio of energy consumption to GDP stayed at the 1980s level, to produce the 1995 GDP, Chinese industries and power plants would have had to burn at least two times the amount of coal.

Despite past advances, China has much work to do if it is to match the rest of the industrialized world's level of energy efficiency. Some challenges to improving energy efficiency include:

1. China's high energy consuming sectors, namely industry, are anywhere from 15 to 50 percent less efficient than similar sectors in OECD countries.

2. While a continued 4.5 percent yearly drop in energy intensity would by 2020 result in a level three times less than that of 1995, China's energy intensity would still be 40 percent more than the current U.S. level.

3. Large coal boilers (still numbering 500,000), water pumps, and fans are on average 10 percent less efficient than those in industrial sectors of developed countries; electric motors are 60 percent less efficient.

4. While the government has focused much of its regulatory energy on the industrial sector, household-level energy use has been relatively ignored. For example, most apartments in China are constructed without wall and ceiling insulation, double-glazed windows or individual temperature controls.

5. Commercialization of energy efficiency technologies is difficult in China, for Chinese banks are not used to lending for energy efficiency projects. Moreover, the upfront costs for such projects are quite large.

Insufficient protection of intellectual property rights hinders foreign investment into energy efficiency technology and research and development.

(Continued on next page)

Emission Credit Trade (continued)

Watson, who advises Chinese companies developing clean power.

Advocates of emissions credits trading look to European state mandates that are driving moves away from dirtier fossil fuels. Biofuel produced in Europe is expected to reach 2.4 billion barrels by 2007, up from 500 million in 2000, according to data from New York-based market consultancy Frost & Sullivan.

By capturing a projected 4.8 million tonnes of emissions from burning rice husks over the next 13 years, AT Biopower could could earn credits worth between $3 and $5 per tonne, according to Marc Stuart of Eco Securities, whose California business has already brokered carbon credit trades in Brazil.

But just how emissions are measured in emerging markets is key, said NRDC's Watson, pointing to discrepancies in Asian infrastructures, levels of amenity and technical capability.

As countries such as India and China industrialise and build appetites for more energy and modern conveniences, rules setting who can and cannot pollute must be well protected, said Watson.

"Is the emissions baseline Germany, where they've squeezed all the efficiency out of every plant? Or is it India, where there is a lot of room for improvement?" he asked.

State Institutions Ordered to Conserve Energy

7 November 2001

Government agencies, which account for 5 percent of total energy consumption in China, have been ordered to make sweeping changes to save energy.

The State Economic and Trade Commission (SETC), the Ministry of Finance (MOF) and the State Councilís Departmental Affairs Administration jointly issued a proposal on Nov. 5 telling governments at various levels and state-supported entities and institutions including the army, armed police, education entities, medical treatment institutions and research institutions, what they must do to conserve energy, the Xinhuashe (Xinhua News Agency) reported.

The report said the government spends 80 billion yuan (US$9.66 billion) each year on energy, constituting a large proportion of Chinaís budget.

Each state institution will be required to set specific energy-saving goals and lay down practical energy-saving measures.

Government purchasing agents were ordered to place priority on acquiring energy-saving facilities or equipment.

In addition, government institutions were ordered to dispose of facilities and products that are not energy efficient.

The proposal requires an examination of all lighting, heating and cooling equipment, office equipment and vehicles.

SETC minister Li Rongrong said that the countryís oil production has fallen behind its economic development, causing oil imports to soar year after year.

He said Chinaís per capita mineral resources are less than half of the global average, especially the oil reserves.

He said that if effective measures are not carried out, China would rely on the international market for 50 percent of its oil by 2020.

In addition to oil, Chinaís supply of some important mineral resources cannot meet demand, either. For some time, the country has had to rely on imports of important raw materials, for example.

On the other hand, Li said the per capita consumption of electricity in China is only 1,038 kilowatt-hours, about one tenth of the world average.

Zhong Guobao, vice minister of the State Development Planning Commission (SDPC), said that by 2040, Chinaís annual consumption of nonrenewable energy will be equivalent to 3.86 billion tons of standard coal, three times greater than now.

However, by the middle of this century, the annual production of nonrenewable energy will be equivalent to 3.2 billion tons of standard coal.

Therefore, Zhong said China would have to keep the annual growth of energy consumption at around 2.5 percent so that by 2040, the country would be able to meet expected demand.

Energy Efficiency in China (continued)

7. As China has moved away from a centrally planned economy, the government's ability to promote energy efficiency will be far difficult than in the past decade.

Because the Chinese leadership appears committed to increasing energy efficiency, and much groundwork has already been completed, there is great potential for even greater improvements in energy efficiency.

1. Much of the industrial production capacity is reaching the end of its life span. Chinese industries are thus in a critical phase of technological improvement, which creates an opportunity to make great progress in energy efficiency.

2. Chinese and American scholars agree that even implementing domestically available advanced technology would result in an energy savings of nearly one-third of the present energy consumption.

3. In order to encourage more investments and development of energy efficiency technologies, Chinese policymakers could establish incentives to encourage investment and trade in advanced energy efficient products, engage in more cooperative research and development with foreign governments and multilateral organizations, as well as promote intellectual property rights protections.

4. The central government might also employ the help of more domestic and international nongovernmental and research centers in energy conservation initiatives. Some government organized NGOs and research centers in China already have led successful conservation campaigns. For example, the Beijing Energy Conservation Center's "China Green Lights Program" saved 22 Thermal Watts (TWh) of electricity in 1996 though the promotion of high efficiency light products, development of a competitive efficient light industry, and the fostering of positive attitudes toward energy conservation.

Korea is a member of the OECD, but it has a shameful energy inefficient record. Energy inefficiency means energy waste. I really don't know how much advanced Korea is compared to that of China. Korea's trade surplus will be wiped out if the oil producing countries raise the price by one dollar per barrel. However, energy conservation is a rhetorical speech in government-sponsored commercials on television. Energy supplies and energy consumers should implement energy conservation and efficiency measures.

Political leadership should demonstrate a strong commitment to energy efficiency in energy and environmental policies. This is political leadership. Political scandals are not a good indicator of good political leadership. Privatization of the energy industry is urgently needed for more efficient use of our related resources.

I hope Korea will learn a valuable lesson from China's energy efficiency program.

Policies to Foster Energy Conservation Firms

16 October 2001

Policy and financial support from the government and the World Bank are expected to create favourable market conditions for energy management companies (EMCs), although there are some factors slowing the field's further growth.

"A favourable environment to attract investors to the energy-saving service industry is being promoted," said Liu Xianfa, deputy director of the Energy Conservation and Resources Utilization Department under the State Economic and Trade Commission.

His remarks came in a workshop held last weekend to discuss strategies for expanding the China Energy Conservation Project, which has proven successful in its pilot operation beginning in 1997.

Jointly kicked off by the trade commission, the World Bank and the Global Environment Fund, the project is aimed at ensuring that China's energy conservation mechanisms are driven by market and will stimulate energy conservation investment.

Three pilot EMC companies have been established under the project.

These companies will implement energy conservation projects for client enterprises and share the energy saving benefits with clients to recoup their investment and obtain a reasonable profit.

The operation of EMCs can overcome the barriers faced in the current energy conservation market, said Liu.

Presently, most energy-saving associations, supervision and service centres are controlled and managed by the government. Without the impetus of market competition, they lack drive and vitality.

However, the energy administration bureaux are now shaking off their role as business owners and encouraging EMCs to offer energy conservation services that respond to market demand.

"The government will pay more attention to making favourable policies, providing information and other support, and supervising the development of EMCs," Liu explained.

Although still in their infancy, the EMCs have shown great potential in the country, where many industrial enterprises are in urgent need of energy conservation improvements.

Up to the end of May this year, the three pilot EMCs in China have entered into 197 energy performance contracts with an aggregate investment of 360 million yuan (US$43 million). It is estimated that EMCs will have shared nearly 500 million yuan (US$60 million) in profits derived from energy conservation with their clients by the time all the projects are completed.

Dozens of new EMCs are being formed and other firms have also decided to get into the business.

Beijing Shenwu Scientific and Technology Co Ltd, originally an energy-saving equipment producer, has decided to form a new department to tap the energy conservation management market.

"In the past, it has been difficult for us to merely sell such equipment without the added incentive of providing service," said Hu Youshan, an official with Shenwu. "With the new system, we can utilize our advantage in the field of equipment to earn more profits."

Right now in China, the biggest difficulty facing EMCs is the lack of money. Since they are a new thing in China, banks and investors are still hesitant to lend money to EMCs or to directly invest in them.

According to Wang Shumao, executive director of the energy conservation project office under the trade commission, his department has established a special guarantee fund of 22 million yuan (US$2.7 million) for EMCs to get essential loans from banks.

The money, which comes from the Global Environment Fund's loan, is being entrusted to financial institutions but is monitored by the government.

"With assistance from the fund, the EMCs will be able to obtain loans to enable them to realize an industrialized and sustainable development," said Terry Ellen Singer, an official from the World Bank.

State Stresses Energy-Saving Education

17 December 2001

Chinese leaders have reiterated their strong support and continuous efforts to improve energy-efficiency and maintain sustainable development. "We have a lot to do to ensure an annual 4 to 5 percent energy-saving rate," said Liu Xianfa, vice-director of the State Economic and Trade Commission's Department of Resources Conservation and Comprehensive Utilization. Liu made the remarks at a December workshop on "Efficient Use of Energy in Chinese Industry," jointly sponsored by China and Germany.

China made great progress in energy-saving during the 1995-2000 period. Standard coal utilization for every 10,000 yuan (US$1,200) of GDP in 2000 was 1.2 tons lower than that in 1995, which stood at 3.97 tons. And in 2001, the energy utilization per unit is expected to decrease to 2.65 tons of standard coal, according to SETC statistics. However, some thorny problems in energy saving are still ahead. Massive publicity campaigns, education and training in this endeavor will occur in the following years. In addition, the State will speed up industry restructuring and perfect the energy-consumption structure to achieve its ambitious energy-efficiency goal.

China Blows Smoke Over Sulfur Dioxide Levels

Asia Pulse/XIC

BEIJING - China has issued an industrial policy aimed at reducing the amount of sulfur dioxide released from chimneys across the country. By 2005, the total emissions of sulfur dioxide in China will be 10 percent lower than in 2000, according to the country's environmental pollution control plan for 2001-05. The new policy is designed to help China achieve the above goal by pushing major coal consumers, such as thermal power plants, factories using coal-burning boilers, and facilities providing heating to urban residents, to decrease the release of sulfur dioxide. Combustion of coal contributes more than 90 percent of the sulfur dioxide in China's atmosphere. The gas turns into acid rain when it is combined with rain or snow and is harmful to the environment. About one-third of China, mainly the densely populated and industrialized south, has so far fallen victim to acid rain. State authorities that oversee industrial development and environmental protection hope that through implementation of the policy, many more thermal power stations and large factories will install desulfuration equipment when burning high-sulfur coal. Meanwhile, medium-sized and small enterprises lacking desulfuration equipment will have to use coal with a lower content of sulfur. Cities are asked to replace coal with cleaner energy, such as electricity or natural gas, in central heating systems and for daily use. The policy was worked out by the State Economic and Trade Commission, the State Environmental Protection Administration and the Ministry of Science and Technology.

China Sand Helps Counter Acid Rain

The Asahi Shimbun
19 March 2002

Alkaline soil carried by the wind in spring helps neutralize acid rain in northern China but loses most of its effect by the time it reaches Japan, say scientists in both countries.

The findings are the result of a computer simulation of the so-called yellow sand phenomenon by a team at the Frontier Research System for Global Change, an affiliate of the Ministry of Education, Culture, Sports, Science and Technology.

The yellow sand is lifted from the Gobi and Taklamakan deserts and carried eastward by westerly winds over northern China. The amount of soil carried this way totals 300 million tons a year, the scientists said.

The soil particles, which contain alkaline compounds such as calcium carbonates, counter acid rain, which is harmful to trees and plants.

The scientists, including Chinese researcher Wang Zifa, developed a way to follow the impact of the yellow sand on rainwater acidity distribution in East Asia throughout 1999.

The simulation found the yellow sand's impact was greatest in northern China, where factories discharge large amounts of pollutants. It increases the pH values of rainwater there by 2 or more, the scientists said.

The pH scale measures hydrogen ion concentration. A pH value above 7 indicates alkalinity, while a value below 7 shows acidity. A value of 7 is neutral.

In southern China, acidic precipitation is observed more often, even though there is less air pollution. The team confirmed this is because prevailing wind directions substantially reduce the amount of yellow sand carried to the region.

The yellow sand's impact on Japan was small, according to the scientists, who said it likely loses much of its neutralizing power while traveling over heavily polluted regions of China. It raises the pH value of rainwater in spring by only about 0.2 in western Japan.

The research is the first quantitative study of the effects of yellow sand in neutralizing acid rain, according to Hajime Akimoto, director of the system's Atmospheric Composition Research Program.

7th Phase of Beijing's Air Pollution Prevention Plan

EHS Review
December 2001

November 1, 2001 to March 31, 2002 has been defined as the 7th phase in the city's Air Pollution Prevention program. The phase focuses on particulate air pollution prevention.

According to the Beijing Issuing 7th phase Air Pollution Prevention Measures Circular, the Beijing Environmental Protection Bureau (EPB) and the Beijing Quality and Technology Supervision Bureau will update existing Air Pollutants Emission Standards for Boilers by January 1, 2002. In it, the EPB will lay out reduction plans for industrial pollutions discharge and industrial coal use.

China to Increase Funds for Environmental Improvements

EHS Review
December 2001

News from Xinhuanet declares that China has allocated 1.2% of its gross domestic product (GDP) for environmental protection and improvement during the 2001-2005 period. This indicates that approximately more than 700 billion RMB will be used nationwide for environmental quality improvements over these 5 years, compared to 360 billion RMB between 1996 and 2000.

In Beijing, investment in environmental protection and improvement is estimated to be approximately 4.7% of the city's GDP, and more than 100 billion RMB has been earmarked for environmental improvements in time for the 2008 Olympic Games.

In Shanghai, China's leading industrial and commercial city, 3% of the city's GDP will be allocated each year for environmental work up until 2005. Guangdong Province, one of China's key economic regions, plans to budget more than 2.5% of its GDP for environmental protection.

China Launches Major Anti-Pollution Drive

12 January 2002

China has some of the world's most polluted waterways

The Chinese Government has adopted a multi-billion dollar programme to clean up the country's heavily polluted waterways and smoggy skies.

The five-year plan is estimated to cost about $84 billion - double the amount spent to control pollution in the past five years.

The plan envisages that by 2005 major pollutants such as sulphur dioxide must be cut by 10% from their 2000 levels.

The central government is to provide initial funding - about $8bn - to kick-start the programme, which will then be financed by local administrations as well as through taxes levied on polluting enterprises.

The BBC's Adam Brookes in Beijing says China has some of the world's most polluted cities and waterways - a result of Communist industrialisation followed by aggressive market reforms.

'Serious' situation

Our correspondent says the Chinese Government is aware that China's environment is in a wretched state.

Prime Minister Zhu Rongji has described the situation as "serious" and the outlook for the future as "not optimistic".

The new plan sets targets for pollution control, indices for evaluating the work and measures to ensure environmental protection measures are implemented.

The director of the State Environmental Protection Agency (SEPA), Xie Zhenhua, welcomed the government's new commitment to the environment.

"Never has the Chinese Government put the environment in such an important position. It is vital to the stability and prosperity of our country and people," said Mr Xie.

SEPA said it would pay special attention to the Three Gorges Dam area of the Yangtze River - where a controversial scheme is underway to build the world's largest hydroelectric station.

Global warming

Millions of metric tonnes of waste are dumped into the dam area every year and the situation is worse elsewhere in the country, according to the World Bank.

In a report last year, the bank singled out worsening land degradation, shrinking forests and deteriorating water quality. It also mentioned the problems associated with the increasing use of cars.

It urged the government to be more proactive and not to be overwhelmed by economic growth. But our correspondent says not everything is bleak.

He says China gets high marks from international experts for what it has done to fight the perceived threat from global warming - emissions of greenhouse gases have dropped by about 15% since the mid-1990s at a time when the Chinese economy was growing very rapidly.

Co-operation on Environment

China Daily
29 November 2001

The Sino-Italian Memorandum of Understanding on Environmental Co-operation was signed on Tuesday in Beijing between China's State Environmental Protection Administration and Italy's Ministry of Environmental Protection. The memorandum involves US$27.7 million of bilateral co-operation projects in 12 fields, including ecological protection, sustainable agriculture, renewable energy, air monitoring and sustainable mobility. According to Xie Zhenhua, minister of China's State Environmental Protection Administration, China will need 700 billion yuan (US$85 billion) in the prevention and treatment of environmental pollution in the next five years.

10th Five Year Plan for Environmental Protection

EHS Review
January 2002

SEPA made public the National Environmental Protection "Tenth-five Year" Plan (2001-2005) in December 2001.

The Plan sums up China's environmental protection performance over the past five years and puts forward objectives and tasks for the period 2001-2005.

The Plan requires that:
1. Discharge quantity for key pollutants such as SO2, dust, COD, NH3-N, industrial solid waste etc. should be decreased by 10% from 2002 levels;
2. Heavy metals, cyanide, petroleum in industrial wastewater must be effectively controlled;
3. Hazardous wastes are safely disposed of;
4. SO2 emission in SO2 and acid rain controlled areas should be reduced by 20% from 2000 levels;
5. Water quality is improved and water pollution prevention objectives are achieved in key fresh water and marine areas;
6. Reducing groundwater pollution trends in cities; meeting water quality standards; and significant improvements in air, surface water and noise quality in large to middle sized cities;
7. Improve safety supervision and management of nuclear and radioactive materials;
8. Prevent damage to the ecological environment caused by human activities;
9. Strengthen environmental protection management in rural areas; and
10. Improve environmental regulation systems, EIA, and environmental training etc.

Based on the above objectives, the key tasks focus on industrial pollution prevention, urban and rural environmental protection, marine, ecological and radioactive environmental management.

To prevent industrial pollution, a permitting system will be widely developed and clean production is advocated. In addition, an environmental tax is under

(Continued on next page)

BP, CAS Join in Clean-Energy Research

24 January 2002

A new center dedicated to the research of clean energy is being jointly established in Dalian, Liaoning province by the Chinese Academy of Sciences (CAS) and the London-based petroleum giant BP Co.

CAS and BP issued a joint statement on Jan. 10, which announced their signing of a cooperative agreement for the research of clean energy, reported the Zhongguo Kuangye Bao (China Mining News) Jan 17.

The newly established CAS-BP China Center will concentrate on basic research on natural gas and hydrogen over the next decade. According to the agreement, BP will contribute to the center a research fund of US$10 million.

The BP research centers are international institutions that work on long-term basic and interdisciplinary scientific research. The center in China will be BPís first research center in Asia and its fifth globally.

Yang Boling, CAS vice chairman, said that Chinese scientists would lead the research and determine the research subjects according to common interests. The two parties would jointly own any relevant achievements and intellectual-property rights.

Chinese scientists' participation in BP's global research network will help improve China's research ability in the petrochemical sector, Yang said.

Dr. Gary Dirks, executive president of BP (China), said that the establishment of a research center in China emphasizes the start of a long-term, substantial cooperation between BP and China's top scientific research body.

According to industry sources, the center's headquarters will be set up at the CAS Institute of Chemical Physics in Dalian. Researchers from the CAS institutes of Shanxi Coal Chemical Research and Shenyang Metal Research will take part in the program, as will researchers from the Tsinghua University and the Chinese University of Science and Technology.

China Plans to Merge Dozens of Small Oil Refineries into Two Giants

7 March 2002

China is planning to merge tens of small local oil refineries into its top two oil giants - China National Petroleum Corp (CNPC) and China Petrochemical Corp (Sinopec) - as a way to ultimately shut down the small businesses.

According to Li Yang, an official with the State Economic and Trade Commission (SETC), the merger is part of the oil refinery sector's plan to speed up its restructuring and improve its competitiveness now that China has entered the World Trade Organization (WTO).

The fragmented sector, troubled by a surplus in overall refining capacity for years, faces great challenges after China joined the WTO last December.

Under the WTO obligations, China slashed its tariffs on gasoline and diesel oil imports to 6 per cent at the beginning of the year from the previous 6-9 per cent.

China will increase imports of refined oil products by 15 per cent annually over the next four years.

Li would not discuss the specifics of the plan, saying "it is still under study."

Zhu Xingshang, an expert at the Energy Research Institute under the State Development Planning Commission, said he has learned that SETC intends to ask CNPC and Sinopec to pay owners of these small refineries for the merger as a first step towards closing them.

"It may be easier for SETC to close these small refineries through such a plan because CNPC and Sinopec are directly controlled by the State, but it will add fiscal burdens to the two oil companies," Zhu said.

There are nearly 130 oil refineries in China with a total production capacity of 250 million tons a year, four-fifths of which are used.

Half of these refineries are small plants run by local governments and have a capacity of just 1 million tons. The rest belongs to CNPC and Sinopec.

More than 110 small oil refineries have been closed thanks to a SETC-led campaign that started in 1998, cutting a refining capacity of 11 million tons.

Li said SETC will strengthen its efforts this year to continue to close small refineries and prevent the resurgence of those shut down.

"However, difficulties remain strong because the small refineries create the bulk of revenue and thousands of jobs for local

(Continued on next page)

10th FYP (continued)

consideration and favourable treatment will be provided to waste recycling and utilization. Waste management will also become more important role over the next five years.

The Plan also lists the planned key projects or proposals during the "10th-Five Year" period, including wastewater treatment projects for the "Three Rivers and Three Lakes", wastewater treatment projects for three gorges, pollution prevention projects for the south to north water transfer, the "Green Sea Project" in the Bo Sea, desulphurisation projects for power plants in SO2 and acid rain control areas, the "Green Water and Blue Sky Program" in Beijing, natural conservation area improvements, central hazardous waste disposal projects, the establishment of a national monitoring network and environmental innovation and research.

China Starts Building Controversial Gas Pipeline

By Bill Savadove
Reuters
February 6, 2002

BEIJING - China has begun building a controversial gas pipeline to foster economic growth in the impoverished west and deliver fuel to the booming eastern city of Shanghai, the nation's biggest oil firm said yesterday.

PetroChina said construction of the 4,200 km (2,600 mile) pipeline had begun following cabinet approval of the project, which has been criticised for its impact on the environment and a route through areas inhabited by minorities.

The $18 billion pipeline will stretch from Xinjiang in the far west to Shanghai, China's financial hub. Xinjiang has suffered bombings and violent protests by the Muslim Uighur minority, some of whom are pushing for a separate state.

Western analysts have questioned the viability of the project, including whether the gas for the pipeline could be extracted economically and whether the market existed.

Global oil giant BP Plc pulled out of bidding for the project despite originally expressing interest.

PetroChina sought to soothe such concerns yesterday, saying construction would be supervised by an outside foreign firm.

"We are constructing a pipeline which will not only bring economic benefits to people along the pipeline, but will also conform to environmental requirements," PetroChina chairman Ma Fucai said.

The pipeline will be built by PetroChina and a consortium led by Royal Dutch/ Shell Exxon Mobile was discussing investing in the pipeline with Shell, PetroChina officials said.

They said that of the roughly 150 billion yuan ($18 billion) cost, 46 billion yuan would be spent on the pipeline, 26 billion yuan on developing gas fields and 70-80 billion yuan for city grids to deliver the gas to users.

PIPELINE TO CROSS WETLANDS

Trial construction had started in delicate wetlands and on crossings for the Yangtze, Yellow and Huai rivers, as well as two other sections: Lunnan to Kuerle in Xinjiang and Jiangsu province to Shanghai, officials said.

Full-scale construction would start in the first half of this year and the first gas would arrive in Shanghai in early 2004, they said. That was later than PetroChina's original delivery date of late 2003.

The Chinese government has backed the project to develop lagging western provinces and reduce dependence on imported oil, while New York-listed PetroChina sees the pipeline as a new source of growth.

"As the owner of the project, PetroChina will enjoy substantial economic benefits," said Zhang Guobao, vice minister of the powerful State Development Planning Commission.

FOREIGN FIRMS EYE HUGE MARKET

Foreign firms hope for entry into China's vast retail market.

The Shell consportium, which also includes Russian firms Gazprom and Stroytransgaz and Hong Kong & China Gas Co Ltd, would share production, set up a pipeline joint venture and a sales company, officials said.

PetroChina would hold a 55 percent stake in the ventures and the foreign consortium 45 percent for 45 years, they said.

China had given approval to Exxon, together with Hong Kong's CLP Holdings, to discuss joint investment with Shell, officials said, but gave no further details.

Gas for the pipeline would come from Xinjiang's Kuqa-Tabei area, which has recoverable reserves of 370 billion cubic metres and should supply 12 bcm annually for 20 years, officials said.

PetroChina would also use the Changqing field in Shaanxi province - China's largest gas field with 750 bcm in proven reserves - to supply the pipeline, they said.

The company had so far signed 45 letters of intent to supply customers with 0.8 bcm of gas in 2003, 8.3 bcm in 2005 and 12.3 bcm in 2008, officials said.

The average gas price would be 1.29 yuan, including tax, although Shanghai would pay 1.35 yuan because of the distance, they said. Some users have complained that price is too high, while PetroChina feels the price is too low.

Oil Refinery Merger (continued)

governments even though they should be closed," Zhu said.

A spokesperson for Sinopec Corp, the listed subsidiary of Sinopec, said the two oil giants may merge these small refineries based on a government-formed assets transfer, the way the parent fully acquired China Star Oil Company last year.

Star Oil Company was China's No 4 oil company after China National Offshore Oil Corp.

"The listed Sinopec Corp will benefit from the plan if the small refineries can ultimately be closed, putting the domestic oil product market in order," the spokesperson said.

Sinopec Corp and PetroChina, the listed arm of CNPC, are suffering from small refineries' bad-quality and cheap oil products on the market. The two companies control the vast majority of the refining business of their parents.

Sinopec Corp now operates 25 oil refineries, the spokesperson said.

SETC has announced that China plans to refine 202 million tons of crude oil this year, compared with 193 million tons in 2001.

The nation has offered a quota of 22 million tons for this year's refined oil imports.

China Turns Corn into Ethanol as Fuel Supply Wanes

Reuters
Kathleen Kearney
19 December 2001

HONG KONG - China is launching its first fuel ethanol plant in an innovative plan aimed at simultaneously bolstering security of energy supplies and improving farm incomes.

"We have to consider energy security...because China is short of petroleum," said Lu Tianxiong, director and senior engineer at Beijing Memsep Technologies Co Ltd.

Officials are acutely aware that China's known oil and gas reserves are running out. Domestic coal and hydropower are widely used for electricity generation. China produces about 163 million tonnes of crude oil a year, or 70 percent of its national needs, importing another 70 million tonnes, mainly from the Middle East.

Alternative sources are costly, sometimes cumbersome to transport and distribute and generally less efficient than oil.

But replacements must be found since China's oil and gas reserves could be exhausted in the next 30 years, Lu said.

Is ethanol, an environmentally friendly but expensive fuel made from farm products, China's alternative? Yes and no.

"For the time being, the cost of this kind of product is too high...but five years from now, production costs could be much lower and then the market prospects will be quite good," Lu said.

Memsep is technical adviser to China's first plant dedicated to the production of fuel ethanol, a 2.89 billion yuan (US$349 million) project called Fuel Ethanol Company Ltd.

Construction began last month on the 600,000 tonnes a year plant in Jilin in the northeast.

CORN FEEDSTOCK

The plant is being set up by Jilin Tianhe Co Ltd, a collaboration between China National Petroleum Corp (CNPC), Jilin Grain Group - the largest government-established corn trader in the province - and trading conglomerate China Resources Corp.

In the heart of China's corn growing region, the plant will consume 1.92 million tonnes of corn a year. Output will be used by CNPC or its subsidiary PetroChina Company Ltd and blended with gasoline or diesel fuel for vehicles.

Since 1998, China has been phasing out use of leaded petroleum products in vehicles, but it has no laws mandating the blending of "green" additives to reduce vehicle emissions.

But the government is encouraging use of fuel ethanol by including trial fuel ethanol production in the Tenth Five-Year Plan (2001-2005).

Jilin Grain's goals are similar to corn growers and processors in the United States, where - as in China - warehouses are bulging with stocks after several years of good corn crops and prices have plunged to 25-year lows as a result.

In the United States, ethanol producers, encouraged by direct and indirect government subsidies, produce about two billion gallons of fuel ethanol a year.

If new legislation promoting the use of renewable fuels is passed, supporters see U.S. consumption rising to five billion gallons annually by 2012.

QUESTIONS ON ECONOMICS

But China's foray into ethanol is still exploratory.

Feasibility studies for two other fuel ethanol plants, one near Hefei, the capital of Anhui province, and another in Nanning, the capital of Guangxi in southern China, are ongoing, Lu said.

The Guangxi plant, which is still in the planning stage, is currently considering producing fuel from cassava and is studying Thailand's experience with the feedstock.

But China is well aware that ethanol is not cheap.

Despite improvements, it takes 100 BTUs (British Thermal Units) of energy to produce one gallon of ethanol, which can produce 138 BTUs of energy. The net gain is not impressive, Chinese officials say.

While China has a surplus of corn and is on constant watch for ways to improve farmers' income, the price of corn in China is too high for its widespread use as ethanol feedstock, said Lu. "Corn currently costs about 1,000 yuan per tonne and it takes about three tonnes of corn to produce one tonne of ethanol," Lu said. "Ethanol's total production cost is thus about 4,000 yuan per tonne."

Costs could be lower in an integrated production system.

But even the cheapest established production costs, in a Canadian venture which used biomass, were US$0.30 a litre or 3,145 yuan per tonne, Lu said.

Meanwhile, Memsep is working on a new process called biostill, which shortens the three-step production process of fermentation, separation and distillation into one operation.

Chinese Turn to Law to Right Pollution Wrongs

By Tamora Vidaillet
Reuters
5 February 2002

BEIJING - Nets brim over with dead fish, blemishing the view of a vast reservoir in China's eastern province of Jiangsu where hundreds of peasants already struggle to eke out a living.

One hardened fish farmer stands on the reservoir's shores, peers into his nets and fights to hold back his tears.

"I have a 14-year-old child going to school," he choked on national television. "I can't pay the school fees. I couldn't hand over any money when the teachers asked for it".

Nearly 100 peasant families had their livelihoods stripped from them after toxic chemicals dumped in the Shiliang river in 1999 and 2000 by a private paper factory reached the reservoir.

Until recently, they would have had little hope of battling the tide of China's enormous environmental problems, unleashed by two decades of unbridled economic growth considered far more important than the impact on the land, air and water.

But they joined the ranks of Chinese pollution victims who have started to fight back.

They won - albeit on paper so far - compensation of 5.6 million yuan thanks to a non-governmental organisation (NGO), the Centre for Legal Assistance to Pollution Victims, which gathered evidence and represented them in court.

"The verdict was passed last month (December) but I am yet to receive all the court documents," Wang Canfa, the group's lawyer, said in his bare office in west Beijing.

"It is not sure they will get the money, but the factory has to cease production," said Wang, director of China's first NGO to offer free legal assistance to pollution victims.

UPHILL STRUGGLE

The small NGO, launched three years ago, has fielded thousands of telephone calls and taken 22 of the cases it deems most worthy to the courts.

This year, the centre plans to widen its scope to help people who blame pollution for their deteriorating health, Wang said.

Growing environmental awareness is helping victims challenge polluters threatening their way of life, experts say.

Last year, more than 400 elementary school children sued a plastics factory claiming a chemical leak made them suffer headaches, dizziness and abdominal pains, according to official media reports. No result has yet been published in national media.

Other, local, NGOs committed to protecting the environment have mushroomed in recent years, adding to an embryonic debate on sustainable development.

"Ten years ago almost nobody ever used environmental law to protect themselves," said influential activist Liang Congjie.

"Some people have started to think it is possible to try and protect themselves with the law, but still very few people practise this," he said.

The battle is an uphill one given widespread corruption among officials who turn a blind eye to offences for personal gain and lax enforcement of otherwise comprehensive legislation.

"If people in the provinces try and sue these companies, they come up against courts which are not very independent because they are influenced by local governments and work units," said Wang. "Even if the peasants are right, they often lose the case."

ACUTE PROBLEMS

That people were starting to fight back showed some progress in a country which amassed a grim environmental record in the dash for economic growth, Liang said.

China unveiled its first "green" five-year plan for economic development in March 2001, acknowledging the need to clear choking air pollution, clean rivers and curb water consumption.

But the task is seen as mammoth given that comprehensive laws introduced over the past five years are rarely enforced.

Acid rain affects 30 percent of the land and widespread soil erosion exacerbates natural disasters, officials say.

The World Bank said last August that land degradation was worsening, forests were shrinking and the explosive growth in car use was adding significantly to pollution.

But in some areas of China, especially the cities, the seeds of environmental awareness are beginning to take root.

"It's a matter of balance. Everyone has the right to have a more convenient, modern way of life but at the same time we have to think about the environment," said Liang, also head of Friends of Nature, one of China's leading environmental advocacy groups.

"I may be ahead of the curve, but more and more people are accepting these ideas".

www.nytimes.com
The New York Times ON THE WEB

Underground Fires Menace Land and Climate

By Andrew C. Revkin
15 January 2002

Fires are burning in thousands of underground coal seams from Pennsylvania to Mongolia, releasing toxic gases, adding millions of tons of heat-trapping carbon dioxide to the atmosphere and baking the earth until vegetation shrivels and the land sinks.

Scientists and government agencies are starting to use heat-sensing satellites to map the fires and try new ways to extinguish them. But in many instances - particularly in Asia - they are so widespread and stubborn that miners simply work around the flames.

There is geological evidence that grassland and forest fires, lightning and spontaneous combustion of coal have spawned such fires for hundreds of thousands of years. In Wyoming and northern China, broad layers of earth are composed of "clinker," the brittle baked rock left behind when subterranean coal burns.

But the frequency of coal fires appears to have risen, experts say, as mining has exposed more and more deposits around the world to fires, both natural and set by people, and the oxygen that feeds them.

Increasingly, scientists are saying the problem needs to be more carefully assessed, both as a potential contributor to global warming and source of toxic air pollution.

A 1999 report by the Clean Coal Center of the International Energy Agency concluded that the biggest coal fires, in China and India particularly, "make a significant global impact."

"These fires are obviously pumping all this noxious material into the air," said Dr. Glenn B. Stracher, a geologist and expert on mine fires at East Georgia College in Swainsboro, Ga. "That's got to be having some effects, but no one has been studying it."

The coal fires are similar to those that smoldered for months beneath the wreckage of the World Trade Center, in that they involve buried fuels and are sustained and intensified by slight drafts of air and heat locked into surrounding rubble or rock. Geologists and engineers who have studied coal fires offered their expertise and specialized equipment ó like firefighting foams ó to emergency officials in Lower Manhattan. But firefighters at the scene stuck mainly with the simplest method: pouring endless streams of water on the wreckage as work crews slowly removed layers of debris.

Many coal fires start spontaneously, when pyrite and other reactive minerals in coal are exposed to oxygen. They begin to release heat, which, if not dissipated by air currents, builds until the coal itself ignites.

Anupma Prakash
An open-pit area in China is being mined for coal even as it burns. Mine fires worldwide are so stubborn and common that they are considered a significant contributor to global warming.

In Indonesia, hundreds of coal fires erupted deep in the rain forests when forest fires spread during an extreme drought in 1997 and scorched exposed coal seams.

Alfred E. Whitehouse, a fire expert for the federal Office of Surface Mining, now assigned to Indonesia, said there were 700 such fires just in East Kalimantan, on the island of Borneo. Some were extinguished by crews using hand pumps and picks to isolate the hot spots. But many are still burning, he said.

The fires persist as long as there is the right mix of fuel, oxygen and heat.

Sometimes, that can be a very long time. One fire eating deep into an Australian peak called Burning Mountain is believed to have been going strong for 2,000 years. The mountain has often been mistaken for a simmering volcano by passers- by, although Australia has no volcanic activity.

In the United States, a common cause of such fires has been the burning of trash dumped into abandoned mines.

That is how the coal fire most familiar to many Americans started 40 years ago, in Centralia, a town in the anthracite region of eastern Pennsylvania. Smoldering trash in a dump ignited a coal seam. The fire steadily crept through abandoned mine tunnels, forcing the federal government by 1984 to evict residents and eventually pay $40 million to buy damaged land.

Centralia briefly gained national notoriety, then faded away. Its population shrank from 1,100 to 40. Smoke and steam now rise from overgrown backyards and cracked, sunken streets, marking the path of subterranean fires that continue to consume buried coal. Geologists say it could burn for another hundred years.

But Centralia's is just one of dozens of fires that smolder unchecked in old mines and coal seams around the country. The federal Office of Surface Mining has tallied nearly $1 billion in accumulated costs from coal fires, primarily in Pennsylvania, West Virginia, Utah, Colorado, Kentucky and Wyoming.

(Continued on next page)

Underground Fires (continued)

And the coal fires in the United States are negligible compared with those overseas. In China's rich northern coal belt, hundreds of underground fires are burning upward of 200 million tons of coal each year, about 20 percent of the nation's annual production. The fires produce nearly as

much carbon dioxide, the main gas linked to global warming, as is emitted each year by all the cars and small trucks in the United States.

Only in the last few years have scientists begun a concerted effort to map and monitor coal fires around the world and calculate how much pollution they are producing.

For the moment, the total is anyone's guess, said Dr. Anupma Prakash, a geological mapping expert at the International Institute for Aerospace Survey and Earth Sciences in the Netherlands. Dr. Prakash has been developing ways to integrate maps of the heat of the earth's surface generated by satellites with geological maps to track coal fires in northern China.

Often, a deep coal fire raises the surface temperatures by only a few degrees, even though the heat in the middle of the fire can easily exceed 1,000 degrees. But that subtle signal is enough to show up from space, particularly when other clues about coal deposits are combined with the heat data, Dr. Prakash said.

The team from her institute, together with Chinese geologists, recently generated a map of China's coal fires that showed a constellation of glowing orange spots spread across the country's northern coal belt, which spans 3,000 miles and is 400 miles wide.

One goal, Dr. Prakash said, is to monitor the region continually from space, so spots that are growing warmer ó indicating intensifying fires ó can be attacked by firefighters before the fires grow to the point where they cannot not be stopped.

"The important thing is to detect the rising heat anomalies ahead of time," she said.

Once they get going, these buried fires are very hard to stop, said Stanley R. Michalski, a senior staff geologist at GAI Consultants, a firm in Monroeville, Pa., that has for more than 20 years studied fires and drawn unp firefighting plans from India to Centralia.

The coal beds in Pennsylvania, Mr. Michalski said, tend to generate particularly persistent fires because the corrugated terrain there has many separate, narrow coal seams that reach the surface, and the ground is heavily fractured, allowing ample oxygen to reach the coal. Many parts of the state, like the foundation of Centralia, are also riddled with old abandoned tunnels that carry air into the coal layers and expose broad surfaces of coal to heat.

For many years, engineers and scientists have been experimenting with a variety of ways to extinguish or control the fires. Some small fires have been snuffed by drilling holes and pumping in inert gases or foams that stifle flames. Others have been flooded by damming surface streams and creating lakes over the burning coal.

Some fires have been controlled by excavating deep trenches that cut off the fires the same way a fire break in a woodland can stop a forest fire from spreading.

But in most cases the costs of such efforts outweigh the benefits. That was why Centralia picked up and moved ó and why another Pennsylvania community, Youngstown, may suffer the same fate.

Overseas, however, some of the fires are in densely populated regions where hundreds of thousands of poor people live on the edges of open pits that fume and flame.

In many such places, the mining industry has simply adapted to the situation, working in and around the burning rock.

Parts of one of India's most important coal fields, the Jharia mining complex, which is rich in low-sulfur coal used to produce coke for steel mills, have been on fire since 1916. In many places, the walls of open-pit mines glow and hiss like lava flows.

The region's 150,000 miners, truck drivers, train loaders and other workers toil stolidly against a constant backdrop of orange flames and brown smoke.

But the fires are far more than an inconvenience. On Sept. 10, 1995, the walls of one mine complex collapsed after being progressively weakened by fires. Water from a nearby canal poured in and flooded the pits and tunnels, killing more than 60 miners.

The population around the Jharia mines has grown from half a million to 1.1 million since the early 1980's, said Dr. Prakash, whose doctoral thesis was an analysis of the fires there.

Mr. Michalski has also surveyed the Jharia fires several times since the early 1990's, when the World Bank hired his company to assess what to do.

A plan was drawn up to modify the mining operations and constrain the fires. But the bank never released the money, Mr. Michalski said.

He conceded that it would take an awful lot of money. "It's a loss of a valuable resource, it's an environmental disaster, it's devastating," Mr. Michalski said. "But this fire is so complicated and so widespread that India could not really afford to extinguish it."

In the meantime, the fires there still burn, and residents and mineworkers continue to adapt.

In places where the ground cracks and slumps and smokes, people simply dismantle their mud-brick homes and move them somewhere else.