The China Sustainable Energy Program
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CHINA CLIPPINGS

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The China Sustainable Energy Program (CSEP) is dedicated to public policy development in China aimed at cost-effective carbon emissions reductions through the deployment of energy efficiency and renewable energy technologies. The science of ongoing global warming is clear, as noted in our opening article. Experts still disagree, however, over the likely economic impacts of ongoing warming. This, however, is clear: many energy efficiency and renewable energy technologies are cost effective today, and these "no regrets" options should be promoted through public policies with all due haste.

China assured the European Union of its commitment to the Kyoto Protocol and called the U.S. decision to not ratify the pact irresponsible. China is the second largest producer of carbon emissions behind the U.S., but it has reduced its carbon emissions in the last five years (p. 6). In the Electric Utilities sector, Chinese policy makers have scaled back plans to deregulate the power sector in response to the California energy crisis (p. 17).

China expert and CSEP Policy Advisory Council member, Michel Oksenberg, passed away recently. Oksenberg helped pave the way to full diplomatic relations with China in the 1970's (pg. 7).

What's Inside . . .

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Scientists Issue Dire Prediction On Warming
Faster Climate Shift Portends Global Calamity This Century

Washington Post Foreign Service
23 January 2001

BEIJING, Jan. 22 -- In the most forceful warning yet on the threat of global warming, an international panel of hundreds of scientists issued a report today predicting brutal droughts, floods and violent storms across the planet over the next century because air pollution is causing surface temperatures to rise faster than anticipated.

The report, approved unanimously at a U.N. conference in Shanghai and described as the most comprehensive study on the subject to date, says that Earth's average temperature could rise by as much as 10.4 degrees over the next 100 years -- the most rapid change in 10 millennia and more than 60 percent higher than the same group predicted less than six years ago.

If new scientific models are accurate, rising temperatures will melt polar ice caps and raise sea levels by as much as 34 inches, causing floods that could displace tens of millions of people in low-lying areas -- such as China's Pearl River Delta, much of Bangladesh and the most densely populated area of Egypt. Droughts will parch farmlands and aggravate world hunger. Storms triggered by such climatic extremes as El Niño will become more frequent. Diseases such as malaria and dengue fever will spread.

"The scientific consensus presented in this comprehensive report about human-induced climate change should sound alarm bells in every national capital and in every local community," said Klaus Topfler, head of the U.N. Environment Program. "We should start preparing ourselves."

The report was drafted by the Intergovernmental Panel on Climate Change, a group of hundreds of scientists established by the United Nations in 1988 to assess warming. The Shanghai survey relies on complex new computer simulations based on weather records from the last 150 years, as well as data collected from ice corings, coral and tree rings -- all of which can provide information on climate going back millions of years.

The results of the new models persuaded the panel to declare unequivocally for the first time that mankind is responsible for global warming rather than changes brought by the sun or other natural factors. "We see changes in climate, we believe we humans are involved, and we're projecting future climate changes much more significant over the next 100 years than the last 100 years," said Robert T. Watson, an American scientist who is chairman of the panel.

The report cited "new and stronger evidence that most of the observed warming of the last 50 years is attributable to human activities," primarily the burning of oil, gasoline and coal, which produces carbon dioxide and other gases that trap heat in Earth's atmosphere.

Carbon dioxide levels have increased by 31 percent over the past 250 years, reaching a concentration unseen on the planet in 420,000 years and perhaps as far back as 20 million years, the report said. In 1995, by contrast, the panel reported only a "discernible human influence" on global warming.

At that time, the group predicted a temperature rise of no more than 6.3 degrees by 2100.

The panel raised that prediction by more than 4 degrees in part because successful efforts to reduce the air pollutant sulfur dioxide, a common element of smog, have had the unintended effect of reducing particles in the air that help deflect the sun's rays, the report said.

The global warming issue has proved highly contentious among environmental scientists, with many respected figures arguing that Earth undergoes periodic climatic changes with or without contributions from mankind.

Fred Singer, professor emeritus of environmental sciences at the University of Virginia and former director of the U.S. Weather Satellite Service, called the new report "a political statement" based on theoretical models that does not conform to existing scientific data from thermometers at weather stations, Earth-circling satellites and high-altitude balloons. Almost all instrumental data, he said, show no warming trend in the past 60 years, and he called data that do "suspect."

But David Easterling, principal scientist at the Commerce Department's National Climate Data Center, noted that reductions in airborne sulfates, which act to cool temperatures, are expected this century because of such factors as the burning of cleaner coal. He called the "physics pretty well established."

The new calculations add urgency to international treaty talks on curbing greenhouse gas emissions that collapsed in November as participants disagreed over how to cut such emissions under a commitment made by industrialized countries in 1997. Negotiations have been complicated by a U.S.-led effort to soften the impact of required cuts by adjusting for the amount of carbon dioxide that is absorbed by each nation's forests and farmlands. New climate talks are scheduled in Germany in May.

"Only a few countries, such as Britain and Germany, are on track to meet their targets," said Watson, who is the chief science adviser to the World Bank. "The United States is way off meeting its targets."

The United States is the largest producer of greenhouse gases, accounting for a quarter of the world total. China ranks second, but its per capita amount is relatively low.

A Blustering Giant Turns Oddly Coy

Far Eastern Economic Review
1 March 2001

Once an environmental bully, China is quietly moving to clean its coal-tarnished image. Some of its motives may be dubious but the results are compelling. So why does China play down its environmental achievements? Politics.

Visitors to Beijing would never guess it, but the Chinese capital is in the third year of a clean-air campaign. In winter, the city's features still often disappear into a sulphurous grey smog. But Beijing now gets days of blue skies and sunlight, too. Official statistics show the concentration of pollutants in Beijing's air, though still high, is falling.

Motivated by such diverse concerns as energy security and energy and public-health costs, the central government in China is pressing local governments all over the country to launch similar efforts. With sometimes less-lofty motives than the central government, many localities are, like Beijing, working to improve energy efficiency, reduce their reliance on coal, explore renewable energy sources and move their economies away from energy-intensive industries.

One unintended result of all these efforts is the curbing of China's emissions of the so-called greenhouse gases that contribute to global climate change. "China has made a substantial contribution to reining in its greenhouse-gas emissions," says Kevin Baumert, a climate expert at the World Resources Institute, a Washington-based independent environmental think-tank, "perhaps more than any industrialized country."

China's vast population and its fast-growing, heavily coal-reliant economy make the country the world's second-largest greenhouse-gas emitter after the United States. But environmentalists hope broader acceptance of China's accomplishments might help kickstart stalled international negotiations over a key international climate-change protocol. Baumert urges China to take more credit for its actions. "Advocates in the U.S. and other industrialized countries would love to see that," he says. "It would be added pressure they could use to get their governments to take action," to curb emissions and ratify the 1997 Kyoto Protocol, which sets binding emissions targets for industrialized nations to meet.

China, though, remains unwilling to crow too loudly. The government fears that if it claims credit for curbing emissions, the industrialized world will feel less responsibility for tackling a climate-change crisis overwhelmingly of the industrialized countries' making.

World governments first began coming to grips with the reality of global climate change in 1992, when they negotiated the United Nations Framework Convention on Climate Change. Since then, scientists have issued ever-more sobering reports about the seriousness of the challenge. The latest one, released in January in Shanghai by the Intergovernmental Panel on Climate Change, chronicles 20th century temperature increases, shrinkage of snow cover and rising sea levels. More assertively than any report before it, it blames human activity for much of the damage. The report warns that the projected rate of warming in the 21st century "is very likely to be without precedent during at least the last 10,000 years."

PRECIOUS RESOURCES AT RISK

China has plenty of reason to treat those findings seriously, says Ding Yihui of China's National Climate Centre, who co-chaired the IPCC panel that produced the report. He says droughts, floods and unusually cold summers--all linked to global climate change--hurt Chinese agriculture and the economy. Global warming threatens north China's already scarce water resources. Climate change even casts doubt on China's plans to spur economic development in its backward western provinces. China is planning to build railways, highways and factories over permafrost, or permanently frozen subsoil, in the west, including a railway linking Qinghai province to Tibet. "What if the permafrost melts?" Ding asks.

Nevertheless, in climate-change negotiations over the years, China has always rejected the notion that it and other developing countries should make binding commitments to limit their greenhouse-gas emissions. It argues that because the developed nations industrialized so much earlier, they are responsible for the lion's share of the accumulated greenhouse gases in the atmosphere and have the wealth to afford clean-up measures, so they should be the first to commit to cut emissions.

The international environmental community sympathizes with that position. WRI's Web site points out that "even though China's population is three-and-a-half times larger than that of the United States, the U.S. has contributed four-and-a-half times more carbon dioxide into the atmosphere" in the 20th century. It adds that per capita, the average American emits 7.5 times more carbon dioxide than the average Chinese.

The U.S., however, has said that it will not ratify the 1997 Kyoto Protocol, which commits developed countries to legally binding emissions targets, without greater "meaningful participation" first from key developing countries, notably China, India and Mexico. "The U.S. is the most powerful country in the world. It is rich. Yet it still can't make itself change its consumption habits. How then can it make demands of developing countries?" says Liu Deshun, deputy director of the Global Climate-Change Institute at Beijing's Tsinghua University. With the U.S. and developing countries such as China each insisting that the other move first, the result has been stalemate. The change to a Republican administration in the U.S. has, meanwhile, increased the uncertainty. Republicans insist that any U.S. action be accompanied by commitments from developing countries.

The irony, environmental groups say, is that China is, in fact, already doing a lot to curb its emissions--if usually for reasons other than mitigating climate change. WRI calculates that without the energy-saving measures China has put in place over the past two decades, the country would be spewing some 400 million more tonnes of carbon into the atmosphere each year. "That's about equal to the current carbon emissions of Korea, Indonesia, Thailand, Singapore, the Philippines and Vietnam combined," WRI's Baumert says. "That's what it means when China takes action. It really has a big impact on global emissions."

Take Beijing. Cynics question some of the motives behind the clean-up. The city's bid to host the 2008 Olympic Games has certainly been a major factor. A decision on the host city will be made in Moscow in July. Yu Xiaoxuan, deputy director of Beijing's Environmental Protection Bureau, worries too, that Beijing's poor air quality deters potential investors and skilled workers. "In the present situation, fewer people are willing to come because our pollution is very heavy," he says. "When people choose where to work, environmental, health and education conditions are basic considerations." Concern for the health of Beijing's own citizens has sometimes seemed lower on Beijing's priority list.

What's become clear, though, is that the city has made progress in tackling its dirty air. With coal-burning a major source of air pollution, Yu says the city has brought its reliance on coal down to just 50% of its energy needs, compared with a 75% average nationwide. By 2007, energy-efficiency savings and fuel substitutions should have reduced the share of coal in Beijing's energy mix substantially further, to 20%. According to official statistics, environmentally friendly fuels and tougher emissions standards for all vehicles reduced carbon monoxide emissions by 18% between 1998 and 2000, and nitrous oxide emissions by 17% over the same period, even while the city added 10% more vehicles to the roads each year.

One of Beijing's three largest power plants is a hydropower station built in the mid-1990s. The other two burn coal, but use modern, imported technology to raise efficiency and reduce harmful emissions. Most Beijing residents have switched from coal stoves to using natural gas, piped in from the country's northwest.

GOING FOR RENEWABLE ENERGY

On the city's streets, some 60% of the public buses now run on compressed natural gas, a cleaner fuel

than diesel or petrol. And nearly half the city's 60,000 taxi cabs run on liquefied petroleum gas.
Beijing has also been at the forefront of exploring renewable energy resources. A number of institutions, such as the Xinqiao Hotel and the Friendship Hospital, have swapped coal-fired heating systems for geothermal ones, which draw naturally hot water for heating from deep beneath the city and then return it.

Economic restructuring is a big part of Beijing's environmental planning. At considerable social cost, the city is closing down factories producing such products as chemicals, cement and metals, or retooling them to produce other goods. Instead, it is encouraging the development of cleaner businesses, such as hi-tech, finance and tourism. The city's goal, Yu says, is to reduce industrial emissions by 30% over the next five years. The most high-profile transformation under way is that of the Capital Iron and Steel Works, or Shougang, which presently accounts for a seventh of the city's total coal consumption. The city has ordered it to cut its steel production by a quarter by next year and to focus increasingly on hi-tech businesses.

Beijing, like the rest of China, still has a long way to go. Raising the efficiency of power plants is one thing. Because the power sector remains a state monopoly with clear lines of authority, upgrading technology is relatively straightforward. Making factory boilers more efficient is another matter, says Liu Xue, an economist at Peking University's Guanghua School of Management. State-of-the-art technology has a harder time reaching factories, he says, because foreign sellers have no single authority to go to with their wares.

Implementation of environmental rules remains a big problem in the city. Bribes, for instance, can still get heavily polluting vehicles around the city's emissions requirements. And some much-publicized measures seem to be largely for show. The Beijing media, for example, reported with fanfare that the city was introducing solar-powered phones, toilets and lights in several sports stadiums. But officials at one of the facilities, the Workers' Stadium, tell the REVIEW that the equipment will actually only be installed if Beijing wins its bid to host the Olympics.

Without the measures China has taken, though, its greenhouse-gas emissions would be much higher. Gradually, the government is beginning to listen to the environmentalists and diplomats who have been urging it to make more of the fact. At a climate meeting in the Netherlands in November, China's chief negotiator, Liu Jiang, noted that the share of coal in China's national energy mix dropped nearly 10% between 1990 and 1999, and that the amount of energy China used to generate a single unit of GDP dropped 50% over the same period. "A large number of developing countries have made great efforts to tackle the problem of climate change," the People's Daily quoted him as saying pointedly, "while the industrialized nations remain at loggerheads."

A Climate Policy That Works

William K Reilly
New York Times
12 April 2001

SAN FRANCISCO — President Bush and Christie Whitman, the administrator of the Environmental Protection Agency, have now definitively abandoned any intention to regulate carbon dioxide from utilities and confirmed that they oppose the Kyoto Protocol, the international treaty to fight global warming.

Many the world over are speculating on the significance of these moves, some countries concluding they can relax their own efforts to reduce greenhouse gas emissions, others despairing that the United States may not lead on the environmental issue of the era.

Is there another way to address the problem of climate change while accommodating the Bush administration's concerns about the science and the costs of a climate policy? Is there a conservative response to global warming?

I believe that a distinctive Bush policy on climate could involve three parts. First, the administration should ask the National Academies of Science and of Engineering to review the scientific evidence on climate change and the availability of energy-efficient technologies — both issues on which the president has expressed concern. The

Intergovernmental Panel on Climate Change has recently concluded that anthropogenic emissions have "contributed substantially" to warming. The National Academies could be asked to review the panel's findings, along with the state of technologies. In this way, President Bush could fulfill his campaign promise to follow the science on climate.

Second, the administration should ask the private sector what it can achieve by way of energy efficiency. What is practical and cost-effective, and how quickly can it be done? It is little known, though quite astonishing, that 11 major companies, eight of them American, have committed to reducing greenhouse gas emissions by a total that exceeds the reductions required of Britain under Kyoto. United Technologies, I.B.M., Baxter, Polaroid and others have committed to improve energy efficiency, or to cut carbon dioxide, by at least 25 percent.

And those who say these are only commitments should look at DuPont, the nation's largest chemical company, which has already reduced its greenhouse gas emissions by 50 percent and promises to cut them by 65 percent by 2010. It has also pledged that 10 percent of its energy needs will be met by renewable sources by that time.

After consulting carefully with companies, the administration should identify realistic goals for the major sectors of the economy. Auto executives, for example, have indicated that their industry cannot make the substantial changes called for by Kyoto in the next seven years but could achieve major improvements in 10 to 15 years. The president needs to get the automobile companies and other important industries to spell out what they can achieve and then commit to these goals.

Finally, we must realize that very few countries are cutting emissions; most will not come close to equaling the reductions required of the United States by the Kyoto Protocol. Many nations would support the administration if it instead made a convincing commitment to abide by the 1992 international convention to combat global warming — which President Bush's father signed — while also agreeing to exceed the goals of Kyoto over a longer period of time. Such commitments would permit a more orderly replacement of capital equipment and put to rest concerns that energy taxes are required or that electricity supplies would be disrupted. President Bush and many in the Senate have decried the Kyoto Protocol's failure to require cuts in greenhouse gases from developing countries. But the United States must have a cogent, credible policy before it can speak with authority to developing countries.

China, second only to America in its emission of greenhouse gases, has actually reduced its carbon emissions over the past five years. The Chinese, in an effort to curb suffocating air pollution, have reduced coal subsidies, switched to cleaner transportation fuels and converted power plants to natural gas from coal. Helping the Chinese to make further progress could be another distinctive element of the Bush climate policy.

In sum, there is another way: Review the state of science and technology, involve the private sector, set realistic goals and seriously engage developing countries. This is the path toward energy efficiency and progress on the environment.

William K. Reilly, chairman of the World Wildlife Fund, was administrator of the Environmental Protection Agency in the first Bush administration.

China Assures EU Over Commitment To Kyoto

Agence France Press
9 Arpil 2001

BEIJING -China has assured the European Union of its commitment to the Kyoto agreement on global warming after the United States refused to support the pact, the EU said Monday.

An EU troika led by Swedish Environment Minister Kjell Larsson was in the Chinese capital after talks in Iran and Russia on salvaging the Kyoto Protocol.

"We have been very much reassured they really want to be part of the process ... and are prepared to get ahead even without the US," Larsson said after meeting Chinese officials including environment minister Xie Zhenhua.

China had rejected US President George W. Bush's contention that the Kyoto agreement let developing nations off the hook on measures to fight global warming, the Swedish minister said.

"This of course is not true. The Chinese have shown some very good results," he said, citing a 30 percent reduction in China's use of coal.

Bush announced on March 29 that the United States would not ratify the Kyoto pact as it ran counter to US economic interests, incurring worldwide anger. China has attacked the US decision as "irresponsible."

"China has already done a lot and efforts are going to continue under the next five-year plan," said James Currie, the European Commission's environment chief.

"China has been very supportive of the approach taken by the EU, we regard this as very positive," he added. "Correcting the misconceptions is an important part of the process."

Signed in 1997 in the Japanese city of Kyoto, the protocol commits 38 industrialised countries to an overall cut by 2010 of 5.2 percent of carbon-rich "greenhouse gases" over their 1990 levels.

Scientists say these emissions, mainly the by-product of burning oil, gas and coal, are warming the Earth's atmosphere and could dramatically change weather patterns.

At the Kyoto conference, China had led the way in seeking to exclude developing nations from firm targets for greenhouse gas reductions, arguing that their economic development would be undermined.
China is the world's second-biggest producer of carbon gases, accounting for 14 percent of world emissions compared to 25 percent for the United States.

The Swedish environment minister reiterated the EU's hope that the US would ratify Kyoto "as soon as possible."

"Without the US, it will be a weaker and less effective solution," said Larsson, whose delegation was heading next to Japan.

In a Swedish newspaper article published Saturday, European Commission President Romano Prodi and Swedish Prime Minister Goeran Persson said the EU was willing to renegotiate Kyoto to suit US objections rather than abandon the whole process.

Michel Oksenberg, China Expert in Washington, Dies at 62

New York Times
4 February 2001

Michel Oksenberg, an American authority on China who as a member of President Jimmy Carter's National Security Council helped establish full diplomatic relations between Washington and Beijing, died on Thursday at his home in Atherton, Calif. He was 62.

The cause of death was cancer, his family said.

As the China expert on the Security Council from 1977 to 1980, Dr. Oksenberg played a crucial role in the negotiations that led to the start of full relations on Jan. 1, 1979.

After President Richard M. Nixon's visit to Beijing in 1972, the United States and China agreed to set up liaison offices in each other's capitals, but not embassies, as the United States continued to recognize the Nationalist government on Taiwan. In early 1978, Dr. Oksenberg accompanied the national security adviser, Zbigniew Brzezinski, to Beijing, where, with the help of Leonard F. Woodcock, head of the liaison office there, they laid the groundwork for the full normalization of relations announced in December 1978.

The agreement involved severing full diplomatic relations with Taiwan by substituting a liaison office for the embassy in Taipei. Dr. Oksenberg helped negotiate an intelligence- sharing arrangement with the Chinese when China's top leader, Deng Xiaoping, visited Washington in early 1979.

In 1980, after the Soviet invasion of Afghanistan, which Beijing and Washington strongly opposed, Dr. Oksenberg was involved in negotiating with China on helping the Afghan resistance movement.

"Throughout all that period when relations with China were high on our agenda, Mike was my right

hand," Dr. Brzezinski, now at the Center for Strategic and International Studies in Washington, said yesterday in a telephone interview.

At the end of last year, when his health was failing, Dr. Oksenberg helped mobilize opinion in the United States government against President Bill Clinton's expressed interest in trying to arrange a visit to North Korea. Mr. Clinton was hoping to announce an agreement to limit missile development and sales.

In a letter to Secretary of State Madeleine K. Albright and the national security adviser, Samuel R. Berger, Dr. Oksenberg cautioned that the United States should not appear overly eager to draw closer to North Korea and that a presidential visit there just before an election risked tying the hands of Mr. Clinton's successor in the White House.

The visit was not made, largely because the United States was unable to reach the understanding on missiles that Mr. Clinton had sought.

Born on Oct. 12, 1938, in Antwerp, Belgium, Dr. Oksenberg was the son of a diamond cutter. The family moved to the United States the next year. He earned a B.A. from Swarthmore College in 1960 and an M.A. in 1963 and a Ph.D. in political science in 1969 from Columbia University. He taught at Stanford University from 1966 to 1968, transferring to Columbia until 1974. He was also on the University of Michigan faculty from 1973 to 1992, taking a leave to work on the Security Council.

From 1992 to 1995, Dr. Oksenberg was president of the East-West Center, a federally financed research and training institute in Honolulu, before moving to the Asia-Pacific Research Center at Stanford.

In 1988, Dr. Oksenberg wrote "Policy Making in China: Leaders, Structures, and Processes" with Prof. Kenneth Lieberthal of the University of Michigan. The work argued that despite China's authoritarian reputation, its bureaucracy strove for internal consensus on major decisions. His other publications included "Shaping U.S.-China Relations: A Long-Term Strategy" (with Elizabeth Economy, 1997) and "China Joins the World: Progress and Prospects" (with Elizabeth Economy, co- editor, 1999).

Surviving are his wife, the former Lois Elinor Clarenbach; a son, Maj. David Oksenberg of the Army; and a daughter, Dr. Deborah Oksenberg, a physician in San Francisco.

Growth in China's Carbon Dioxide Emissions is Slower than Expected

Sinosphere
Volume 4 Issue 1 Winter 2001
Jonathan E. Sinton and David G. Fridley

Concern about China's emissions of carbon dioxide runs high because the country is now the second largest contributor to global greenhouse gas emissions, and seems poised to become an ever larger source. China now accounts for about 14% of global emissions of carbon dioxide from fossil fuel use, by far the most important greenhouse gas produced by humans, compared to 23% for the US.

Since 1999, LBNL's Environmental Energy Technologies Division has been assisting a group of national-level Chinese energy researchers to develop and use a computer model to analyze scenarios of China's energy use and carbon dioxide emissions from 1998 to 2020 (China Energy and Carbon Scenarios Project). While development of complete scenarios is still some months away, one conclusion has already become clear: it seems highly unlikely that China will surpass—or even rival—the United States as the world's leading emitter of carbon dioxide by 2020.

In fact, China's emissions of carbon dioxide have shrunk by 17% since the mid-1990s, from just over 800 million metric tons of carbon [MtC] in 1996 to about 670 MtC in 2000, as energy use has fallen. Remarkably, over the same period, GDP grew by 36%. The reduction in emissions is shown in Figure 1, which compares China's actual carbon dioxide emissions with emissions scenarios from a number of widely circulated studies, our provisional revised baseline for China's future emissions, and actual and projected carbon dioxide emissions from the United States. The figure demonstrates the wide range of emissions levels that have been attributed by different studies to China 20 years hence, and the uniform expectation of significant growth (2% to 5% per year between 2000 and 2020). China's carbon dioxide emissions are already 100 to 200 MtC below what was expected in 2000, approximately equivalent to all carbon dioxide emissions from Canada (at the low end of the range) or Germany (at the high end). Accounting for shrinking energy use in recent years

also brings down estimates of China's carbon dioxide emissions in 2020 by several hundred MtC, substantially widening the projected gap between emissions from the United States and China.

While the decline in carbon dioxide emissions in the late 1990s was not entirely intentional, it demonstrates that China, even without undertaking legally binding commitments under an international agreement to reduce carbon dioxide emissions, has nevertheless contributed substantially to reducing growth in global emissions. The drop in energy use—almost entirely a reduction in coal use—was brought about by a complex combination of forces, including energy-efficiency programs, energy price and market reforms, household fuel switching, and especially economic system reforms that closed inefficient factories and shifted production to more-efficient ones.

These forces, as well as increasing availability of natural gas and strengthening environmental-protection efforts, will continue to suppress growth in energy demand in the future, even as the Chinese economy grows over the long-term. Statistics and other information show that China's energy use is already growing again, slowly. If economic growth continues at a very high long-term average rate of 5% to 6% per year (as called for in official long-term plans), we estimate that, by 2020, China's carbon dioxide emissions will be just over 1,100 MtC ("Revised Baseline Projection", Figure 1), about twice its 1990 levels, and still significantly below US emissions in 1990 of 1,300 MtC. Even if China managed to expand its economy at the current rate of 7% to 8% per year for 20 years, natural gains in efficiency, structural change in the economy, and improvements in fuel structure would mean that its carbon dioxide emissions in 2020 would be about 1,600 MtC, or near the level of emissions from the United States in 2000.

Even though growth in carbon emissions is likely to be slower than expected, further reductions may be desirable, and could be achieved with net gains to China's economy. Deliberate policies to affect energy supply and use could range from increasing the availability of natural gas and renewable energy sources, to raising the efficiency of end-use devices like electric motors, vehicles and appliances. Such efforts would not only further drive down growth in China's carbon dioxide emissions over the coming two decades, but, as has been shown for other countries, could also boost productivity and reduce local and regional environmental costs. Such an outcome would benefit not just China, but all nations with an interest in her economic and environmental performance.

SOOTING THEIR NEEDS: China's Coal Use Decimating GDP, According To Officials' Estimate

(26 March 2001) China's use of coal as its main energy source is causing environmental problems that erode 10 percent of China's gross domestic product, according to estimates by the country's State Environmental Protection Administration.

Chen Heping, an official from China's State Development Planning Commission, said that the country burns 27 percent of the world's coal consumption and is the only large country in the world to use coal as its main energy source. He announced this in Beijing on March 22, reported the *Zhongguo Xinwen She* (China News Service) on March 23.

Chen said that China produces the highest amount of sulfur dioxide exhaust in the world. He also said that China's carbon dioxide exhaust ranks second in the world, producing 13 percent of the world's total, behind the first ranked United States.

China is now the third-largest energy producing and the second largest energy-consuming nation in the world, Chen said. But experts predict that by 2040, the annual per capita consumption of energy will reach 2.38 tons of standard coal, far below the present level of that of the developed countries, the article said.

According to Chen, the modernization of China can only be built based on the efficient use of conventional energy sources and the development and of reusable energy sources.

STILL IN THE RACE

(15 May 2001) Passersby walk near a billboard advertising Beijing's bid to host the 2008 Olympics. The International Olympic Committee's (IOC) evaluation report was released today, which gave Beijing, Toronto and Paris high marks, but ruled out Osaka and Istanbul as potential hosts. The IOC will make its final decision on the host city in Moscow on July 13.

Regarding China, the IOC report said, "It is the commission's belief that a Beijing Games would leave a unique legacy to China and to sport, and the commission is confident that Beijing would organize an excellent Games." It also said, "The combination of a good sports concept with complete government support results in a high-quality bid." China's bid committee said in a statement, "Today is a very good day indeed for the people of Beijing, for the people of China and for the Olympic movement."

The IOC report did not focus on political issues, but instead looked at technical matters and acknowledged "environmental challenges" in China. But it added, "The commission notes the process and pace of change taking place in China and Beijing and the possible challenges caused by population and economic growth in the period leading up to 2008, but is confident that these challenges can be met.

Chinese Planners Are Dreaming About Cities - Mega-Cities

Rueters News Service
14 March 2001

Beijing- Cities with populations the size of whole countries, big enough to swallow up a Canada of 30 million people with ease, or squeeze in a South Korea of 46 million.

A network of cities rising from coastal plains and river deltas that will help absorb, eventually, a population greater than the 281 million of modern-day America.

These urban behemoths are not fantasy. Housing will be needed to cater for a population expected to grow a net 10 million a year for the next decade and increase to 1.6 billion by 2050 from 1.25 billion now.

Each year for the next 20 years China will need to find work for 12 million jobless peasants, according to some Chinese studies. And the cheapest and most efficient way to do this is to expand existing cities, and build huge new ones.

"It's the most economic way to create infrastructure, housing, jobs and pollution control," said Andy Xie, chief economist at Morgan Stanley Dean Witter in Hong Kong.

"With these large cities, things that weren't possible before are now economically viable."

The population pressure has reached bursting point. China has four times as many people as the United States but only half the habitable land.

Rural incomes are falling. Riots by angry farmers are commonplace. And an estimated 200 million peasants are on the move, surplus rural labourers prowling through cities in search of jobs on construction sites and in factories.

ENVIRONMENT A WINNER

Urbanisation has become a priority for Chinese leaders haunted by visions of mass rural unrest.

At a meeting of the annual session of parliament last week, Premier Zhu Rongji called for city construction to "increase job opportunities and sources of income for farmers".

Dai Junliang, an official in the Ministry of Civil Affairs, predicts that 40 new cities will spring up each year for the next 20 years until there are 750 million people living in urban areas.

Official figures put China's current urban population at around 390 million, but experts say the figure is closer to 455 million.

For Xie, the bigger the better when it comes to cities. Massive economies of scale, he argues, will allow China to build state-of-the-art infrastructure it might not otherwise be able to afford.

"Telecommunications are going to reach levels never seen before, there will be super-modern transport systems," he said.

All this construction and urban job-creation will underpin China's economic growth for decades to come.

Another big winner will be the environment.

"Scattered rural industries are heavy polluters," said Songsu Choi, principal urban economist with the World Bank based in Washington.

A NATION OF MEGALOPOLIS

Zhou Yixing, a geography professor at Peking University, envisages "metropolitan interlocking areas", or huge "megalopolis" that devour cities and towns across a vast area.

One would be based on the northern cities of Beijing and Tianjin, each with a population of more than 10 million and lying about 110 km (70 miles) apart.

"Beijing lacks abundant arable land and it lacks a port, but Tianjin has both," said Zhou.

"Linking with Tianjin will make Beijing stronger."

Shanghai would form the biggest megalopolis in terms of area and population, Zhou predicted, stretching around the mouth of the Yangtze river.

The Pearl River Delta region, covering the southern cities of Hong Kong, Shenzhen and Zhuhai would be a natural third megalopolis.

Last to develop would be a northeastern urban sprawl stretching from Dalian to Shenyang in Liaoning province, Zhou said.

And although the government wants to develop the poverty-stricken interior as part of a so-called "Great Western Development" plan, geographers and economists agree it is never likely to catch up with the rich coast.

"The West does not have good links and they lack ports," said Zhou. "All the big urban centres will be on the coast."

Xie agrees, adding that migration from the West to the coastal areas will become a problem.

"If anything, the population over there is going to decline, because we have seen migration outside of these areas already," he said.

Qu Geping says Chinese leaders overlook environmental costs

ChinaInfo
27 February 2001

National People's Congress Resources and Environment Committee Chairman Qu Geping said recently that Chinese leaders often forget about environmental costs. Shanxi Province is very polluted, but its heavy industry failed to make the region rich, instead just leaving its citizens living in clouds of coal smoke. Conversely, Dalian City, by improving its environment, helped create the conditions for more rapid economic growth.

China's Giant Dam Faces Huge Problems

Washington Post Foreign Service
7 January 2001

YICHANG, China -- When China started building the giant Three Gorges Dam here in 1993, its leadership sought to use the undertaking -- the country's most ambitious engineering project since the Great Wall -- to highlight the superiority of its socialist system. But now, halfway into the construction, some Chinese officials, engineers and activists say the project has instead become a testimony to malfeasance, incompetence and systemic weakness.

Dai Qing, a leading Chinese journalist, has called the project "a black hole of corruption." Several Chinese engineers, who spoke on condition of anonymity, expressed concern that construction flaws could trigger a disaster. Economists said low electricity prices could mean the $24.5 billion project will operate at a deficit. Some environmentalists have predicted the dam will not really improve flood control on the Yangtze River. And political analysts have fretted in public that the way local officials are handling resettlement of 1.3 million people to make way for the project could lay the foundation for instability and unrest.

"From all angles this project has enormous problems," said one senior Chinese engineer, who has worked on the project since its inception. "But China's system, being what it is, doesn't seem to be able to correct such a massive mistake. Our leaders are worried that if it did, the regime could fall."

Since winning power in 1949, China's Communist government has used gigantic projects as a key element of nation-building. Partly because of China's tradition of using irrigation programs to control its population, water management and hydroelectric projects have been a natural choice for a party captivated by political mobilization and penetration into rural society. By the end of the 1980s, China had built more than 80,000 reservoirs and hydroelectric plants.

But the Three Gorges Dam towers over them all, so massive it is difficult to fathom. A visit to the dam site at Yichang, 600 miles southwest of Beijing in central China, shows a huge concrete wall that will be 600 feet high and 1.2 miles long when completed. From the top of a small mountain, thousands of workers laboring on the project look like ants. Massive tower cranes resemble Tonka toys. A dull roar emerges from the region, and at night floodlights illuminating the work can be seen from Yichang's hills for miles.

When completed in 2009, the government says, the Three Gorges Dam will qualify as one of the biggest construction projects in history. It will be the largest hydroelectric dam in the world, five times wider than the Hoover Dam. It will take 26 million tons of concrete to build.

With an estimated capacity of 18.2 million kilowatts, the project is expected to supply as much as 11 percent of China's energy needs. But now there is doubt whether Three Gorges' power will turn a profit in a country enjoying a glut of electricity and falling power prices.

The government has said the dam will improve flood protection along the Yangtze River. But recently experts have noted that the dam would have done little to soften the deadly floods of 1998, which occurred mostly along the tributaries and lower reaches of the Yangtze's proud run.

Because of the project's close association with the leadership -- Li Peng, No. 2 in the Communist Party, has been the main cheerleader -- criticism has been muted in the Chinese media. Prime Minister Zhu Rongji has spoken on numerous occasions about improving quality control, but he also has been tough on critics. Chinese sources said he told Li Rui, a former water resources minister, to stop criticizing the dam.

Nevertheless, newspapers have reported that more than $57 million has been stolen from a fund that is supposed to help relocate the people who live in areas to be flooded by the dam. Another $24 million, the reports have alleged, was filched by a contractor who imported hundreds of used trucks, bulldozers, excavators and loading vehicles but charged his buyers as if they were new. Hundreds of officials have been investigated for corruption in connection with the project, 97 because of misuse of resettlement funds, the reports say.

Reports about construction quality problems have been less frequent and far less detailed. But in

November, the official New China News Agency said "a number of quality problems have been laid bare in the course of . . . construction." Concrete blocks at one part of the dam site were found to be hollow, it said. An accident involving a U.S.-built tower crane killed three workers in September and halted concrete pouring in some areas for a month.

"Such accidents have further intensified the existing contradiction between construction pace and quality control," the news agency said.

The report implied that the China Three Gorges Project Corp., responsible for the construction, came late to quality control. It established a general quality inspection office in August, seven years after the project began. China's cabinet, the State Council, also set up an expert group that has "of late relentlessly pointed out some problems in construction quality," it said, adding that Western engineers, including an American company, are reviewing the work.

About 400 million people live along the 4,000-mile-long Yangtze River, most of them downstream from the dam. Any accident could have disastrous consequences, threatening millions of lives.

Chinese officials contend the dam's environmental impact will be minimal. But in October, a major state-run daily newspaper alleged that the dam could turn the Yangtze and a 366-mile-long lake to be created by the dam into a cesspool.

Behind the dam a vast reservoir, 50 miles longer than Lake Michigan and up to 580 feet deep, will submerge two cities, 11 county seats and 114 towns. Chongqing, a large urban area with 30 million people, pours 940 million tons of industrial waste water and 245 million tons of domestic sewage annually into the future site of the reservoir. Only 28 percent of industrial and 8 percent of urban domestic waste water is treated.

But no issue has been more politically troublesome than resettlement. That is because, while construction problems can be covered up for a while or corrected later, the relocation problems have been exposed to public scrutiny as China's society opens up and people with grievances go to the courts or seek support in public opinion.

During a recent news conference in Beijing, Three Gorges officials said that despite widespread reports of corruption in resettlement areas, the process is moving smoothly. As of July, 248,000 people who lived on the banks of the Yangtze have been resettled, they said, some as far away as Shanghai and Xinjiang province in China's vast northwest.

But Strategy and Management, an influential Beijing-based periodical, warned last year that if resettlement funds are not increased and more care is not taken in moving people, "the relocation issue will likely become an explosive social problem, a source of constant social instability in our country for the first half of the next century."

Groups of angry resettled farmers routinely demonstrate against the treatment they receive. Thousands have journeyed to Beijing and provincial capitals seeking support within the higher reaches of government.

About 500 resettled families have banded together and are asking for help in Tongliang, 400 miles west of Yichang.

Yan Shugao is one of them. The 63-year-old former orange farmer was part of a government delegation last March when he first saw the rice paddies and onion fields of Tongliang, 40 miles northwest of Chongqing. Yan had an important job to do back then. As a local leader for the past 30 years in a village on the Yangtze River, Yan had credibility with the people back home. Yan's task, after seeing Tongliang's sights, was to tell his neighbors that life in Tongliang was going to be good, that the soil was fertile, that prospects looked bright.

Good Communist that he is, Yan followed instructions. He and hund reds of other local leaders returned home after similar expeditions and convinced their followers that the Chinese government was offering them a square deal. Move away from their homes in Yunyang county along the Yangtze to make way for the project, the word went out, and life could actually improve.

Yan's group dutifully left homes along the cliffs next to the Yangtze in August. But now they are sorry.

"I was tricked," the father of three said recently. "I feel like I have let these people down. They trusted me and I let them down. . . . We are fruit farmers, not rice farmers. We are boatmen and small-businessmen. There is nothing for us here."

When Yan was brought here in March, he said, he was promised good land for his group, in complete fields. When they arrived in August, he and his followers received isolated, small patches set along steep inclines and at the side of the road, so that one

family might be forced to till as many as four or five plots. It was land none of the local farmers wanted.

Yan said average income ranged from $250 to $500 a year back home. "Now it's not clear to me how we are going to make half of that," he said.

Yan and five other families have moved into a rundown, abandoned home for the elderly that they bought for more than $4,000, an imposing sum in rural China. When Yan asked whether he could move his small noodle factory to Tongliang, he was told he would have to pay $600 to hook up the electricity, ironic for someone resettled to make way for the world's biggest hydroelectric generator.

Other members of the group said they worried that they would not have enough money next year to send their children to school. Government moving subsidies have run out, they said. Most of the villagers are in debt. Many have sneaked back to Yunyang, where they continue to work in the deserted orchards and ply boats along the river. A demonstration that they attempted to hold on Nov. 25 was blocked by the police.

"The central policies on resettlement are generally good," said Huang Weixiang, a 30-year-old farmer and father of three girls as he showed a visitor the six small plots of land that made up his allotment. "But on the local level, things get messed up. We're the weakest link, so everybody is squeezing us. Really, we want to go home."

Power Reforms Set to Slow

(24 April 2001) Plans to open up China's tightly controlled power industry are likely to be scaled back from the sweeping market reforms originally proposed.

The expected switch to more gradual reform follows California's deepening electricity crisis which has forced policy makers to change their thinking. The government is anxious to ensure that any moves to make the industry more competitive do not threaten the security of power supplies.

"California's crisis warned us that we should be very cautious when undertaking the reforms and consider all the circumstances," said an official from the State Power Corp. "It is impossible to create a fully competitive market at one strike."

The reform plans, being drafted now, aim to break up the virtual monopoly of State Power, which controls half the nation's generation assets and all high-voltage transmission grids.

State Power would be broken up into several generating companies which would compete in the market, with the intention of forcing down electricity prices for consumers and industry.

It would remain the sole grid operator.

The power corporation tends to put electricity from its own plants onto its grid even though the energy price is higher than that of independent plants.

A government official, who once advocated that State Power should be stripped of almost all its power plants, indicated that, because of the lessons learned from the Californian crisis, the reform plans were likely to be reassessed. It was "not impossible" for State Power to keep some generating assets to help ensure supplies were not disrupted.

But, to ensure the continuity of power supplies was more important than setting up a competitive market, some experts believe.

Zeng Ming, an adviser on the drafting of the reforms, said: "The security of power supply should always be the first priority." He suggested that State Power should retain at least 20 per cent of its generating plants to balance the peaks and troughs of supply and to bring prices down if they rose too high.

The State still hopes that, under the latest reform plans, power plants will be able to bid via a computer system to transmit their electricity through the grids, creating a competitive market in power generation.

But Xia Qing, a professor from Tsinghua University, said the Californian crisis had shown that the balance between power demand and supply could not be met wholly in this way.

California's 1996 deregulation allowed 85 per cent of its electricity transactions to be conducted through a bidding system. It allowed wholesale prices - the charges paid by utilities to the generating companies - to float, but kept price caps on the amount utilities could charge customers. When wholesale prices rose sharply last year, utilities were pushed into the red and faced bankruptcy.

Its problems showed that power supply cannot rely totally on the bidding just a few minutes ahead of transmission, Xia said.

The grid operator should be given time to forecast demand and allocate electricity to customers by signing long-term contracts. Zeng suggested that about 80 per cent of power supplies should be fixed by long-term contract, while the other 20 per cent could be sold through bidding system.

At present China only allows power plants in Shanghai and five other provinces to sell 10 to 15 per cent of their output through a bidding system as an experiment for competition.

According to the government official, California's crisis was worsened by its failure to build any new plants for 10 years. A "reasonable pricing system" would give investors a better return and encourage them to build more plants.

The reform, analysts said, would be a compromise between customers' demands for competitive pricing and power companies' need for a reasonable profit and security.

The State would also need to loosen its proposed environment protection policies so that more power plants could be built.

Power Sector Price Bidding Comes To Zhejiang

(31 January 2001) Zhejiang province plans to set up an all-round competitive electric power market this year.

It introduced price competition into its power market on Jan. 1, 2000, making it the experimental city of national power reform. As part of the experiment, Zhejiangís electric grid network and power stations will be separated from each other, and the price of the electricity transmitted between them will be determined through price bidding.

Not including Huaneng Changxing Power Plant, coal power plants in Zhejiang that can produce more than 50,000 kilowatts currently sell electricity through price bidding, according to a Jan. 26 (Xinhua News Agency) report. The now-widespread practice of bidding has effectively broken up the power generation monopoly, the article said.

Zhejiang's ultimate goal is to have electricity provided to urban and rural residences by a single power grid network, meaning all residents will pay the same price for electricity. This year, Zhejiang will complete the conversion of power networks in the cities of Hangzhou, Ningbo and Wenzhou, as well as in most of the countryside.

Shanghai Implements 50% Nighttime Rate Discount For Electricity

(30 April 2001) More and more residents in Shanghai will have cooler summer nights this year because the cost of electricity will be 50 percent less at night than during the day.

According to Shanghai's power supply department, 400,000 households in Shanghai will have the "electricity meter with separate rates for different time periods" installed this year, reported the April 20 Hexun Caijing (Homeway Financial News).

Beginning in May, the price of power in the city will be 0.61 yuan (US$0.07) per kilowatt-hour (kwh) between 6 a.m. and 10 p.m. (Beijing Time) but fall to 0.30 yuan (US$0.04) per kwh between 10 p.m. and 6 a.m.

Officials from the power department said that residents who often use air conditioners and electric water heaters at night would get the most benefit from the new electricity meter.

Although analysis indicates that while residents don't usually change their power-use habits, they can save up to 25 percent of power per day by using the new meter. Calculating by 0.30 yuan (US$0.04) per kwh at night, residents may cut their power bills by 12.7 percent, the article said.

Shanghai's the first

Shanghai is the first large city in China to widely adopt separate rates for power usage during different times. The installation of the new meter for the 400,000 households is considered one of the practical things that the municipal government is doing for the residents this year.

Although the project of new meter installation is generally welcomed, some residents are still hesitant because of the 100 yuan (US$12.10) "initial installation fee," the article said.

According to an official with the Shanghai Electric Power Co., the installation of the new meter is aimed to provide added convenience to the residents. The company fully respects the personal choices of the residents who may postpone the installation or choose not to use the new meter at all.

Management Regulation on Power Consumption Conservation Issued

ERM China/EHS Review
February 2001

The State Economic and Trade Commission and the State Development Planning Commission jointly announced the Management Regulation on Power Consumption Conservation on December 29th, 2000. The regulation contains six chapters and 29 articles. It covers power consumption conservation, responsibility division, power use management, power demand management, technology improvement, and methods of reward and punishment. The following are key issues:

-Consumers whose annual power consumption exceeds 3,000,000kwh, should ask companies that had been qualified, to conduct an electrical balance test every two to four years, and then make measures to reduce power consumption.

-Feasibility studies of fixed asset investment projects should include a power saving evaluation of electrical facilities. High power consumption engineering projects should be evaluated by qualified consulting institutes.

-Nine high power consumption products, including electrolytic aluminium, silicon iron, carbide, caustic soda, ethylene, and cement are set the highest limits of 2001 and 2005. Those who violate the limits will be given a period of time warned to reduce consumption within the limits allowed. If this is not achieved, the units will be forced to close by the departments.

Reform in the Power Sector: Li Peng's Electric Problems

Strategic Forecasting
7 February 2001

Summary

An intensifying campaign against official corruption has begun entangling some of China's most senior officials, with potentially significant effects on leadership over the next three years. The political ambitions of former Premier Li Peng, who built his bureaucratic career in China's power industry, may be crippled by a scandal now unfolding in the State Power Corporation, the country's monopoly supplier of grid electricity.

Analysis

Li, an engineer by training, served as minister of electric power in the 1980s. He has long been unpopular among Communist Party reformers, both for his hard-line political stance – he played a central role in the decision to use deadly force against demonstrators in Beijing in June 1989 – and his conservative economic views, which have obstructed what more market-oriented officials see as critical reforms of China's state-controlled assets.

Partly because of his unpopularity in the wake of the Tiananmen massacre, Li was marginalized in recent years. After completing his term as premier, he was assigned a superficially impressive but essentially symbolic role as chairman of the National People's Congress, China's almost powerless legislature. Nevertheless, no one doubts he has greater ambitions, and, in the tradition of Chinese bureaucratic politics, his old associates in the Ministry of Electric Power should have proved useful allies when the moment was right.

Li Peng's problem is that the Ministry of Electric Power no longer exists. Like most Chinese specialized economic ministries, it was abolished under the 1998 administrative reforms. The reforms turned it into a specialized quasi-corporate body, the State Power Corporation, and placed it under the supervision of the nation's main economic regulator, the State Economic and Trade Commission, or SETC. The move, which stripped power ministry officials of their regulatory and licensing authority, had the unintended – but perhaps not unwelcome – effect of undermining Li's power base.

Almost all of China's industrial ministries are facing

similar transformations, first into state-owned corporate enterprises and later into shareholding companies. As a natural monopoly, however, the power distribution business is different since it cannot be converted into a competitive market simply by allowing enterprise managers to run their own affairs.

Like most developed countries, China intends to deregulate its electricity market over the long term, introducing competition among independent suppliers of power to the national grid. But this requires complex regulatory reforms that can have disastrous consequences; California's recent experience provides a useful cautionary tale here.

Beijing's public statements point to a cautious approach, with the removal of direct government authority over the industry as a first stage. In subsequent stages, the State Power Corporation will gradually sell off power plants to independent operators, retaining its role in the operation of the national power grid without continuing to generate electricity itself. Once enough generating plants are under management independent of SPC, some form of price competition will probably be introduced.

It seems, however, that China's electric power bureaucracy has embarked on a program of resistance to the reforms, which are seen largely as the brainchild of Li Peng's successor and nemesis, Premier Zhu Rongji. Although the Power Ministry has been abolished at the national level, its provincial branches, known as "power bureaus," continue to operate in most parts of the country. They have yet to surrender their authority to local organs of the SETC. The SETC's Beijing headquarters issued a rather plaintive circular in November 2000, urging the bureaus to hand over their administrative functions by the end of the year, but apparently this has not taken place. A December 2001 deadline has been set.

Given this context, recent scandals at SPC appear to be only too convenient for Zhu and his fellow reformists. Tan Aixing, SPC's former director for "international cooperation," and Zha Keming, a deputy general manager at the company, have reportedly been detained on suspicion of accepting kickbacks from foreign energy companies in exchange for contracts to build two large power plants on China's east coast. With multibillion-dollar scams emerging almost weekly, the triviality of this particular case is striking: the major accusation against Zha is that he accepted part of a foreign contractor's bribe totaling less than $400,000.

In political terms, however, the matter is far from trivial. Two of Li Peng's children have followed in his footsteps by building careers in the electric power industry, and both have close ties to the two men now in detention. Tan Aixing is reportedly the former supervisor of Li's daughter, Li Xiaolin, who heads a state-run investment company involved in helping Western power firms negotiate contracts with the SPC.

After a steady succession of leaks about Tan and Zha's alleged corruption, Beijing's reformers now appear confident enough to push forward with faster reforms of the power sector reforms. The ruling State Council promised more detailed regulatory announcements in the next three months. Li Peng, on the other hand, has fared poorly in recent weeks, particularly after the mysterious release of classified documents, published in English as The Tiananmen Papers, which detailed his complicity in the Beijing massacre. With both Jiang Zemin and Zhu Rongji scheduled to retire from their main official positions in 2002, Li may find it more difficult than he expected to regain the authority he enjoyed a decade ago.

State Power Giant Closes More Small Plants

China Energy Efficiency Information Bulletin
January 2001, Vol. 7

Xinhua News, 27 December 2000 The State Power Corporation, the nation's largest power supplier, has closed down small thermal power plants saving the company 30 million tons of coal and reducing emissions of millions of tons of carbon dioxide over the past three years. During this period, the company closed a total of 7.8 million kilowatts of capacity (or 80 percent of the total shut in the nation), while 3.11 million kilowatts of capacity were closed down just in the past year. Though more than 70 percent of the country's electric power comes from thermal power plants, China has vowed to close down more such plants in the 10th Five-Year Plan (2001-2005) period.

Corruption at China's State Power Corp. Under Investigation

Washington Post
25 January 2001

BEIJING -- In a months-long probe of the country's electric monopoly, Chinese authorities have investigated officials close to the No. 2 Communist Party official and, in an unusual move, examined the involvement of foreign companies in possible corruption.

The investigation has also underscored how China is using an anti-corruption campaign to tarnish the reputation of high-ranking leaders before a key meeting that will decide who will lead the Communist Party, Chinese and Western sources said.

The sources said two senior officials at the influential State Power Corp. are under investigation for allegedly accepting bribes from Western companies or their Chinese partners. The Discipline Inspection Committee of the Communist Party's powerful Central Committee has taken over a floor of the power company's headquarters as it has probed scores of other officials as well, the sources said.

The investigation is unusual because it involves foreign firms. China's battle against corruption, which has resulted in thousands of prosecutions and dozens of high-profile executions, had previously avoided implicating Western companies, even though Western executives routinely acknowledge doling out substantial payments -- gifts, scholarships, access to foreign real estate -- to Chinese officials.

The case is complicated, Chinese and Western sources said, because it appears to involve two battles at once. One is an attempt by supporters of Premier Zhu Rongji, a reformer and No. 3 in the party hierarchy, to go after associates of the conservative legislative chief Li Peng, the No. 2 man and the architect of the Tiananmen Square crackdown 12 years ago. The second is a bureaucratic tussle between reformers and the State Power Corp., which has resisted repeated efforts to break its virtual monopoly on power generation and distribution in China.

Energy generation is one of China's most lucrative sources of investment, attracting $4.4 billion from foreign firms in 1998 and 1999. Western diplomats said the lure of corruption was intense. "It's not like car plants, where you need maybe five or 10. You need dozens of power plants," one Western diplomat said. "The temptation is huge."

China's bidding system also facilitates backdoor deals, despite a new law designed to regulate the awarding of government contracts. Once bids are made for power projects, sources on the project often reveal the contents to competing firms. Corruption can occur at any of the 54 steps mandated in the technical approval process, diplomats and businessmen said.

The probe centers around two senior officials at the State Power Corp., Tan Aixing, the company's retired head of international cooperation, and Zha Keming, a deputy general manager. The pair are suspected of taking bribes from foreign firms or their Chinese partners for awarding lucrative power contracts, Western diplomats said. Tan and Zha were not available to comment. Tan was detained in July and Zha is under a form of house arrest where he can be interrogated night and day, Chinese officials said. A spokesman for the State Power Corp. said he had no comment on the investigation and that Zha had retired.

The diplomats said the projects involved in the probe include a $1.2 billion deal, backed by a $400 million World Bank loan, to build a coal-fired electrical generating unit in Shanghai, and a $290 million power plant in Rizhao in eastern Shandong province. Shortly after the Shanghai project was awarded in 1998, Western diplomats said, Chinese authorities detained six members of a Shanghai government power agency and questioned them about overseas trips paid for by a major Western firm. A report by Shanghai-based diplomats from another Western country said the six were being probed for allegedly taking bribes. Nothing more was heard about the investigation until last summer when Chinese officials began to speak to Western power company executives about Tan and Zha.

In a report on the power industry, Clearthinking, a western research and consulting firm based based in Beijing, alleged that a Western firm paid Zha a portion of a $368,000 payoff to win a contract. "Zha was only doing what most other bureaucrats in China do: taking extra cash to supplement his downmarket salary," said Nick Driver, managing director of Clearthinking. "So when government prosecutors caught up with him and his accomplices . . . he was reportedly apoplectic. Other cases with better-known protagonists were going uninvestigated and

unpunished." A World Bank spokeswoman in Beijing said the bank declined to comment on the investigation. Chinese and Western sources said the energy investigation was launched in part to isolate Li, second in the Communist Party hierarchy only to President Jiang Zemin.

China's leadership is engaged in a fractious battle for influence before the convening of the 16th party congress, scheduled for 2002. Li and his relatives have long been associated with the power industry. In the 1980s, Li served as minister of electric power and was a deputy premier in charge of power projects. One of Li's sons, Li Xiaopeng, is president of China Huaneng Group Corp., a power generating firm. Zha is a vice chairman. Li's daughter, Li Xiaolin, runs China Power Investment Corp., which often helps Western firms lobby the State Power Corp. and other government agencies for contracts.

The Associated Press reported that Tan at one point supervised her work. The investigation coincides with a major shake-up in China's energy industry and intense competition for contracts. Between 1994 and 1997, China's was the world's fastest-growing power market as breakneck economic development ran up against an electricity shortage. Foreign firms flooded into China, and local governments desperate to increase generating capacity gave them sweetheart deals, guaranteeing returns of 15 to 16 percent for 15 to 20 years, said Feng Fei, a senior economist at the Development Research Council, a government research organization. Chinese armed with MBAs from American universities were called into to structure deals to get around a government regulation that stipulates that all investments greater than $30 million require approval from Beijing.

By 1997, an energy shortage had turned into a glut. And the sweetheart deals went bust. American-backed firms such as Panda Energy International, Inc. -- whose $110 million project to build a thermal power plant in northern Hebei province had been backed by letters to the Chinese government from then-Texas Gov. George W. Bush and Sen. Jesse Helms (R-N.C.) -- Foster Wheeler Corp., Illinova and Intergen found themselves involved in projects that the Chinese either wanted to renegotiate or cancel. Competition for power generation contracts increased, Western diplomats and Chinese officials said. As the boom ended, China's government began to attempt to reform the power industry. For a while, Feng said, China even considered following California's lead in deregulating the industry. "We decided against it," he said with a smile.

In a move designed to separate the biggest power generator from the government agency responsible for regulating the industry, China did away with the Electric Power Ministry and turned the generating part into the State Power Corp. It established a regulatory agency, which employs only about 20 people -- so the State Power Corp. is effectively still regulating itself. China also began to allow other companies to generate power. But since State Power Corp. is both generating power and deciding which other plants can sell their electricity, it began to favor firms in which it had investments or whose bosses had connections in Beijing, Feng said. This reluctance to reform angered senior officials in Beijing, including Zhu, Chinese sources said. The more reluctant the State Power Corp. was to accept the reforms, the more its top officials risked being investigated. "Finally, people got fed up," Driver, the director of Clearthinking, said. "Zhu's people moved into the State Power Corp. because it was getting in the way of reforms.

This is a typical case of using a corruption investigation to ram through economic reforms." Feng said the creation of a competitive power industry in China was inevitable. The difficulty was in the details. "The direction is clear," Feng said. "But the bureaucratic hurdles are high. Changing this industry will take another 10 years."

China Prepares to Utilize More Hydropower Resources
China Daily, 2 January 2001

According to the State Power Corporation of China, the nation's largest power producer, China's installed hydropower capacity is likely to increase by 35 percent from the current 74 million kilowatts to some 100 million kilowatts by 2005, when hydropower is expected to represent 27 percent of the nation's power generation capacity, a 3.5 percent rise from its current level. Abundant hydropower resources in the western regions, especially along the upper reaches of the Yellow River and Yangtze River, will play an important role in fulfilling the country's ambitious power goals.

How Canada Assists Chinese Power Monopoly

National Post
15 February 2001

Team Canada's host in China, Premier Zhu Rongji, has performed miracles in restructuring much of China's debt-ridden state sector. Burdened with hundreds of thousands of decrepit state companies that could neither repay their debts nor create new jobs, Mr. Zhu shut down thousands of money-losing coal mines, textile factories, and steel works, slashing 12 million jobs in the last three years. He gave the military five months to divest its business empire of trading companies, luxury hotels, and nightclubs. He granted cities greater autonomy to run their own affairs -- a move credited with improving the country's investment climate and providing new incentives for environmental cleanup. The Far Eastern Economic Review describes his reforms as "the largest transfer of industrial property since Mao Zedong nationalized industry in the 1950s."

But Mr. Zhu's plans to bring competition to the last big holdout of the monopolists -- China's power industry -- have stalled. China's old guard has decided to make its stand for central rule in the power sector and it has found an important Western ally: Canada.

Under Mr. Zhu's plans, the power industry would no longer be run as a monopoly. State power companies operating hydro dams and nuclear stations would have to compete with private power companies for access to customers. Consumers would need to pay for transmission costs as well as generation costs, giving local power producers -- who don't need to ship power a great distance -- a major cost advantage over distant suppliers.

If Mr. Zhu and his reformers succeed in implementing this plan, China's multi-billion dollar hydro and nuclear empires -- long subsidized by Canadian taxpayers -- could face bankruptcy. Even without these reforms being fully implemented, the state power industry, a bastion of central planning, knows that it cannot find willing customers for power from its hydro dams and nuclear plants.

Chinese officials now openly doubt whether the Three Gorges dam, backed by Canada's Export Development Corporation, will be able to sell all its output when it starts generating power in 2003. The provinces and cities slated to buy its power either already have enough power, or they prefer to have the private sector build local power plants to meet future demand.

Other large government-run hydro projects face the same predicament. The US$3.5-billion Ertan dam, built with Canadian grants and World Bank loans, has run at an annual loss of US$120-million since it came online in 1998. It, too, can't find enough customers. Its largest prospective customer, Chongqing municipality, balked at buying its overpriced power. The newly built US$4-billion Xiaolangdi dam, again backed by Canada and the World Bank, can't find customers either. As the retired deputy general manager of the Three Gorges Project Corporation recently explained to China Business Times, provincial governments and municipalities favour local power plants over the central government's distant hydro dams because local plants produce lower-cost power and, when they're privately owned, generate local tax revenue.

Under pressure from residents who are tasting democracy and making environmental demands, cities are also switching from coal to cleaner-burning gas -- but rarely with the help of Canada. The city of Lanzhou, on the World Health Organization's list of the world's 10 worst-polluted cities, is working with Siemens of Germany to co-finance and retrofit its existing coal plant with gas turbines and to build a new gas-fired plant. Hangzhou city, with Japanese financing, is building a 100-megawatt, gas-fired co-generation plant that will save 200,000 tons of coal a year and eliminate dozens of the city's inefficient industrial boilers. Already, five major Chinese cities have built their own natural gas networks to promote private investment in gas-fired power plants.

While Canada partners with China's aging monopolists to push outdated, money-losing technologies -- Team Canada is expected to announce another Three Gorges Dam contract today -- China's newly privatized power companies are mostly turning to U.S. and European energy know-how.

"Gas is the quickest way to get a turnaround in pollution levels," says Brian Anderson, chairman of Shell Companies, Northeast Asia, who saw China's cities begin the switch from coal to gas in 1998. With only 2% of China's energy needs currently met by gas (coal still provides 70%), there is plenty of room for

growth. Last year, China's State Council approved construction of a US$12-billion, 4,200-kilometre gas pipeline from Xinjiang to Shanghai, expected to be built in partnership with Enron and BP Amoco. Royal Dutch/Shell Group is investing US$3-billion in gas pipelines and power plants to serve Beijing and neighboring cities.

In the coastal province of Guangdong, where electricity demand has grown rapidly over the last decade, Swiss-giant ABB has built several combined-cycle plants, running them on alternate fuels (diesel, blast furnace gas) until natural gas comes online. An adv anced ABB combined-cycle plant supplies electricity and steam to China's largest steelmaker, the newly-privatized Bao Shan Steel Corporation. Shakou Power Plant Company now supplies electricity to Foshan city using a 280-megawatt oil-fired combined-cycle plant financed by Hong Kong banks.

Knowing that large hydro, coal and nuclear cannot compete with this new breed of cleaner and lower-cost power producer, the central monopolists are fighting back. To prop up the uneconomic nuclear plants that Canada and China's domestic nuclear industry are providing, China's State Council not only provides a host of subsidies, it wants to force large power consumers to buy nuclear power. To prop up the Three Gorges project -- a pariah that no western government would touch before Canada endorsed it with subsidies on a previous Team Canada mission -- the State Economic and Trade Commission announced that provincial and city authorities will have to buy electricity from the Three Gorges dam once it starts generating ele ctricity in 2003. At the same time, the government is shutting down small power plants, ostensibly for environmental reasons, and forbidding electricity distribution authorities in areas served by large hydro dams to buy power from private suppliers.

But these successes by the old guard at subverting markets are exceptions. Apart from Canada, the power monopolists have few friends. Should the power monopolists lose their grip to Mr. Zhu -- as have other monopolists in China's economy -- Canada's power industry may find it has few friends in China.

Renewable Energy Gains Currency Towards a Sustainable Energy Path in China

Refocus Magazine
Jan Hamrin, Executive Director
Center for Resource Solutions
April 2001

China has made great strides in the last two decades in bringing prosperity to a greater share of its people. The country's Gross Domestic Product (GDP) averaged an annual growth rate of 9.6 percent between 1979 and 1999. Many older state-run industries are being replaced by a dynamic new economy. Unfortunately, this economy requires a huge engine to run it, and prosperity has brought with it a huge cost in the form of air pollution. In 1999, two-thirds of the primary energy consumed in China was produced by the burning of coal. Even with improvements in end-use energy efficiency, energy demand continues to grow and so does the air pollution. In China, pollution is causing serious health problems, crop damage and acid rain, all of which are taking a social and economic toll. The World Bank estimates the burden of air and water pollution in 1995 to be about $50 billion or 8 percent of GDP.

Acid rain has affected more than one-third of the land in China, and the economic losses approach two percent of the entire country's gross domestic product. A study estimated that China could eliminate its need to import grain if the haze and soot over grain producing areas was reduced. Researchers believe that haze may be depressing China's farm yields by 5 to 30 percent. Seven of the ten cities with the worst air pollution in the world are in China, with pollution levels that greatly exceed World Health Organization standards. Finally, there is the matter of China's carbon emissions, which now rank second in the world. In 1990-1996, the increased CO_2 discharge in China accounted for over 90 percent of the increases in the world, and the result has been mounting international pressure to bring these emissions under control.

For all of these reasons, the topic of clean and renewable energy is now gaining currency in many Chinese government circles. While a number of policy statements and actual regulations have been tried to accelerate the pace of renewable energy development in China, the actual results have been disappointing. Dr. Jan Hamrin, Executive Director of the Center for Resource Solutions and Seth Baruch, International Program Director, Center for Resource Solutions describe the current situation in China concerning renewables.

Great potential

In China, wind capacity, according to many experts could reach tens of thousands of megawatts, but today stands only at 286 MW. China's urban landfills generate almost no usable landfill gas, and while the Three Gorges project gets all of the attention, there is an untapped potential for as much as 75,000 MW of small hydro - defined in China of having a capacity of 25 MW or less.

There are some notable exceptions, however, where renewable energy technologies have been significantly developed. China's solar water heater industry is among the largest in the world and is a major exporter. In 1990-1998, the total heat collection area used for solar water heaters increased by ten times, and in the next decade, solar water heaters are likely to increase at an annual rate of 15 percent. Today, about 1,000 enterprises are engaged in the development, manufacturing, marketing and installation of solar water heaters. And China's numerous research institutions are filled with talented scientists working to commercialize biomass, photovoltaic and ocean-generating technologies.

All in all, however, Chinese policy officials are looking for a new approach, and with assistance from the World Bank and Global Environment Facility, China is examining whether mandates now being adopted in the West - such as renewable portfolio standards - can be modified to work in China.

Existing RE policies

In China, many of the laws on the books are not enforced and often pieces of "legislation" are framed more like general statements than actual regulations. This fact reduces the impact of existing policies and makes adopting new policies all the more

challenging. Chinese experts point to existing policies, such as exemptions on VAT and other tax and financial incentives that have been helpful in limited situations. For example, companies operating small hydro facilities can charge a reduced VAT of 6 percent (instead of the typical 17 percent). The same courtesies are not extended to other renewable technology areas however.

Other policies have not produced much. One of the most concrete laws was a 1994 law requiring utility companies to purchase wind power for a price based on the generating cost plus a reasonable profit. Independent power producers were to be guaranteed grid access. The law also stated that the incremental cost of wind power above the average price was to be shared by the whole grid, ensuring the financial burden of wind energy would be spread across thousands or millions of consumers.

Although this policy seems direct and clear, loopholes have enabled utilities to get around this regulation. Central utility authorities can refuse to sign power purchase agreements with independent wind developers. In some cases, the local utility may sign a power purchase agreement for 100 percent of the wind project's output. But implementation results in the utility paying the negotiated premium price for only a few kWh and paying only the average system price for the rest of the output. Given the fact that the cost of wind is higher in China relative to countries that have a mature wind industry (and because China has so much cheap coal, the average system price is very low) no wind developer can operate under these conditions.

Barriers to RE in China

For all of the effort that has gone into developing these policies, few have dealt with the fundamental barriers to renewable energy in China. Any new effort, such as a renewables portfolio standard (RPS), must deal with these barriers, and that is why it will not be one policy that changes the environment in China but a number of different policies and programs - particularly efforts aimed at developing a local industry and creating enforceable power purchase agreements. Many of the barriers described below are not unique to China, but if China is to develop a strong renewable energy capacity, the issues below will have to be addressed:

Lack of an Independent Power Industry: The United States and Europe passed laws in the 1970s and 1980s requiring utilities to buy power from independent power producers (in the case of the US, utilities purchase electricity at the avoided cost). This was the single most important law in the renewable energy industry because it created a framework for enforceable power purchase agreements between utilities and IPPs. Creating the IPP industry was crucial for renewable energy because utilities do not have the expertise or interest in renewable projects. If experience in the West is any indication, it will be critical for China to develop an IPP industry and equally as important, a viable framework for long-term power purchase agreements, enforceable by actions of the court.

Pricing Policy: Perhaps the most significant barrier is how electricity prices are set and costs distributed. Currently, utilities have to obtain approval from the central government to raise prices, but tariffs are set somewhat arbitrarily and do not necessarily correspond to the cost of production. Therefore, a utility investing in wind may possibly not be able to pass on the higher costs to consumers (at a minimum, there would be a time-lag until the higher tariffs are approved). This means that any investment in premium power reduces cash flow. Compounding the problem is the fact that the costs for premium energy purchases are often not spread across the entire province let alone among provinces. Local distribution companies on the county or city level bear all of the costs for renewable power built within their jurisdiction, and that is a high burden. If the costs of renewable generation were spread across a larger group of consumers (all those who receive the benefits), their impact would hardly be felt.

Transmission problems: In China, much of the renewable resources are in regions with low energy demand, such as Inner Mongolia and Xinjiang. Because the need for electricity could be hundreds or thousands of miles away, there are serious questions about the ability of China's already shaky transmission system to handle the movement of all this electricity. Where transmission capacity is not sufficient, it will be impossible to get renewable generation to the cities that need it (without significant investments in transmission lines). In fact, some laws limit the amount of renewable electricity that can be supplied to the local grid because of concerns about the additional burden on the transmission system.

Lack of Local Manufacturing: China is trying to develop an indigenous industry for renewable technologies, and has succeeded in some non-electric and non-grid connected technology areas. But despite a good deal of research and development, China's wind, biomass and geothermal industries are not nearly as developed as their Western counterparts,

which means less experience in installing, maintaining and servicing renewable facilities. It also means few investors with knowledge of developing products, assembling business plans and designing financing packages. Local manufacturing of renewable technologies should contribute to significant cost reductions.

Working towards a new paradigm

Recognizing that current efforts to date have not produced the desired results, the Chinese government - led by the State Development and Planning Commission (SDPC) - is working to implement a new program. Encouraged by some of the Western experience, SDPC is looking at a range of options, such as a portfolio requirement. Mandating that 5 percent of total electricity sales come from renewable resources is one figure cited in the 10th Five-year Plan. Other options include a national levy to support renewables, commonly referred to as a systems benefit charge, and a feed-in tariff. Currently, the RPS has received the most attention, but there is still no consensus on which direction to go. If government officials did decide on an RPS, several key questions would have to be answered.

What should the level be set at? This is fundamentally a political decision that will be based in part on the perceived cost of an RPS and on which renewable resources are included in the mandate.1

Should each province have its own RPS target or should there be a national standard? Which technologies should be considered eligible in the RPS? Particularly thorny is the issue of hydropower.

Should there be green certificates and trading, especially for areas of the country that lack substantial renewable resources? Should existing capacity be included in the RPS standard?

What penalties should there be for non-compliance? Is enforcement really possible? Who should hold the RPS obligation (wholesale provincial electric companies, local distribution companies, developers of new generation facilities)?

The barriers to implementing an RPS or systems benefit charge are too numerous to list here, but China's greatest challenge will be to develop a viable policy structure in a country where the capacity and experience with building renewable energy is limited. Indeed, even Europe and the US have very little experience with credit trading and other features that are common to these types of policies.

For this reason, it is probably best that China start small, perhaps a provincial RPS pilot with simple credit trading mechanisms, the experience then being transferred to other provinces. In addition, China will need some kind of independent regulator to oversee and enforce any policy. The fact that the utilities come under the umbrella of a powerful state entity, the State Power Corporation, will make the job of any independent regulator - if it is ever formed - even more difficult.

Fortunately, assistance from the World Bank has generally moved in the right direction - begin small and built up gradually. Indeed, it may take years before a fully-fledged RPS is adopted across the entire country. Going too fast could generate too much opposition within the government, the result being a collapse of any effort and a set back for renewable energy development in China. Currently, the Bank and GEF are looking at three pilot provinces to develop a "mandated market policy." The phrase is deliberately vague because whatever develops may be a hybrid of different Western models and will certainly be a program completely unique to China.

While working on the local level, the Bank and other organizations (including the US-based Energy Foundation) are working on the national level to try to clarify the conflicting and overlapping roles of different government agencies in overseeing the energy sector. An ideal result of this exercise would be to create a distinct regulatory authority that all government entities understand is responsible for enforcing whatever renewable energy policy develops.

Finally, as stated above, an RPS by itself may be unworkable or prohibitively expensive without concurrent policies to reduce the costs of renewable energy. In the end, the sale to political leaders will be economic development and jobs, particularly in the Western regions of China that are now such a priority for Beijing. Success here will be enhanced by low-interest loans, production tax credits, VAT exemptions, extensive resource assessments and incentives to create local manufacturing plants. These policies - well known in the West - combined with a mandated market initiative will do much to make renewable energy happen in China. The interest of foreign and domestic investors will no doubt be piqued if the government makes many commitments with a consistent message.

Restructuring and China's RE Future

Portfolio standards, systems benefit charges and other policies are a recent development, spurred in large part by the double-edged sword of electricity restructuring. While market liberalization can bring new resources to bear for renewable energy development, without strong lobbying by environmental organizations, restructuring usually leads to a deterioration of "public benefits" programs. This is a particular concern in China, where there is no real constituency able to influence government environmental policy. On the other hand, utility pressure to reduce every cost possible is immense. Restructuring poses another problem: uncertainty. In China, the future shape of the utility sector is murky at best, and the lack of clarity over what agency will have what responsibility is slowing any movement towards consensus on renewable energy policy. Given the slow transition, solutions will not be immediately forthcoming. Yet this is the time, when the mold is not yet cast, for renewable energy officials in the SDPC to maintain the momentum to include mandated market policies and other programs to solidify the role of renewable energy in the new structure. This is a critical time for a comprehensive policy framework to provide orderly guidance during the transition - particularly for new and emerging technologies.

Wind turbines in Inner Mongolia.

ChinaOnline

The Answer Is Blowin' In The Wind

Debra Lew and Jeffrey Logan

(12 March 2001) Wind power could play an important role in China's electricity sector, but key barriers must be confronted before this clean energy source meets its potential.

Electricity consumption in China grew by 10 percent in 2000 raising new questions about how the country will power its factories, businesses and homes over the coming decades. China's traditional options—coal and hydro—have significant environmental and social repercussions that have increasingly taken on serious political and economic undertones.

Natural gas has received much attention lately as an alternative, but renewable energy sources such as wind are also gaining favor.

China has been developing its wind resources for more than a decade and is the world's largest manufacturer of small turbines, with roughly 170,000 small turbines installed. However, China had only about 345 megawatts (MW) of installed capacity—equivalent to the output of a small coal or gas-fired plant—by the end of 2000.

For comparison, Germany led the world with 6,100 MW, while the United States and India had 2,500 MW and 1,200 MW, respectively. The 10th Five-Year Plan (2001 to 2005) calls for a nearly fivefold increase in China's wind capacity by 2005 to 1.5 gigawatts (GW).[1] With proper incentives, however, China could easily surpass this target.

China's wind-power resources are abundant. Approximately 250 GW of exploitable wind resources exist at a height of 10 meters (32.8 feet) above ground. The coastal regions of Guangdong and Fujian, along with parts of Inner Mongolia, Xinjiang, Shandong, Liaoning and Zhejiang provide excellent sources of wind power.

Today, most grid-connected wind turbines are installed at a height of at least 50 meters (164 feet). Because wind speeds typically increase with altitude,

[1] A gigawatt, or 1 million kilowatts, is the size of a typical large power plant. By the end of 2000, China's entire power sector had 317 gigawatts of installed electrical generating capacity.

China's total wind potential could far exceed 250 GW.

The pollution mitigation potential of wind power is significant. If China develops even one-half of its conservatively estimated wind resources, it could generate about 275 billion kilowatt-hours (kwh) of power each year—about one-fifth the country's current demand—displacing the need for 125 million tons of coal, the accompanying 2 million tons of sulfur dioxide and 65 million tons of carbon emissions.

Challenging barriers

Technical, commercial and regulatory barriers restrain expansion of wind power in China. Wind-generated electricity is still relatively expensive, and technical problems need to be solved before wind can contribute more significantly to China's power mix.

Extensive manufacture of large, high-quality turbines in China could lower costs when compared to the units it currently imports. Most imported wind turbines currently rely on concessionary financing, but these subsidies may actually slow development of a sustainable market for wind power.

New financial and regulatory incentives, such as tax breaks and competitive bidding for planned projects, could heighten the impact of grid-connected wind farms and accelerate the development of a market for wind power in China.

Competing with coal

Costs to construct wind farms, currently around US $900 to US $1,000 per kilowatt, continue to decline, especially when developers take advantage of economies of scale. Large wind farms in the United States now produce power for about US$0.045 cents per kwh. Federal tax credits play an important role in further stimulating the U.S. wind market.

In China, wind power is still considered expensive relative to the competition. The government has subsidized coal and hydropower for decades. As a result, Chinese coal-fired power plants are relatively inexpensive to build and fuel, resulting in costs of as little as 3 cents per kwh.

On the other hand, Chinese utilities are currently paying US $0.05 to US $0.12 per kwh for wind power. One reason costs are high is that most Chinese wind farms are small, preventing them from achieving economies of scale.

The environmental benefits of wind power, namely the elimination of harmful emissions, are often ignored in prices. In September 2000, however, the State Environmental Protection Agency (SEPA) introduced new regulations to increase the fee on sulfur-dioxide emissions from roughly US$25 per ton to US$120 per ton. This and other environmental costs in the price of power could make wind power more competitive.

The cost issue

China has recently begun restructuring its power sector to lower costs and improve efficiency, with competition among some generators. As this occurs, one issue to address is how the cost of wind power, if higher than other sources, is covered.

Currently, many wind-power developers are subsidiaries of provincial utilities. The incremental cost of wind power, if any, is drawn from utilities' profits, not their customers. Moreover, because the buyer and seller of power are often the same company, there is no incentive to reduce wind-power prices.

In addition, export of wind power across provincial boundaries is difficult. A proposed Inner Mongolian wind farm in a World Bank project is facing delays because other provinces are unwilling to purchase this wind power.

Building local production capacity

China is trying, with some success, to develop its own wind-turbine technology, both to ensure self-sufficiency and to cut costs. Currently, however, only a handful of large Chinese turbines are produced at a cost comparable to imported units, but increased market demand leading to increased production should reduce these costs.

China is a world leader in manufacturing small wind turbines, 100 watts to 3,000 watts, but it did not attempt to produce large units, 100 kw and above, until a decade ago. Several companies in China produce 200 kw to 300 kw wind turbines, either as joint ventures or under license to foreign companies. Demand for these is low, however, because imported 600 kw and 750 kw units are more cost-effective and have a reputation for higher quality.

A near-commercial model project was built by a Dutch developer as a build-operate-transfer project.

The Ninth Five-Year Plan (1996 to 2000) called for greater local manufacturing of large-scale wind turbines. In 1998, Xinjiang Wind Energy Co., after buying a license from a German manufacturer to build a 600 kw turbine, became the first Chinese company to commercially manufacture large-scale wind turbines with mostly Chinese components.
To further promote localized manufacturing, the State Development Planning Commission (SDPC) has required that all new wind farms have at least 40 percent local components before they are approved for construction.

Furthermore, the State Economic and Trade Commission (SETC) has set up the National Debt program, which provides favorable loans for wind farms that have locally manufactured components. Already 80 MW of energy have been approved in the program.

The flip side of international assistance

Capital for infrastructure projects such as wind farms is often limited in China, but the Danish, Dutch, German, Spanish and American governments often provide concessionary loans. For example, the government of Denmark has provided zero-interest loans for 10-year terms for their turbine manufacturers to gain access to the Chinese market.

Concessionary loans help the Chinese wind sector in the short-run by facilitating installations of wind farms. Over the long-run, however, they stifle the development of a sustainable commercial market because wind installations are limited to those that obtain concessionary finance.

By its nature, concessionary financing is limited. In addition, these loans are tied to purchases of equipment from the host country, reducing competition and discouraging use of Chinese-manufactured equipment. In addition to distorting the market and limiting development of wind power, subsidies reduce competition and encourage high capital costs.

Selected projects

To address this issue, the World Bank and Global Environmental Facility (GEF) approved the Renewable Energy Development Project in 1999 to promote commercialization of wind energy in China through competitive bids for 190 megawatts of wind turbines at five wind farms.[2]

The bank hopes this project will establish clear and consistent guidelines for power-purchase agreements and foreign investment. This project is on hold, however, while it awaits Chinese government approval.

A near-commercial model project was built by the Dutch developer Nuon, on Nan'ao Island, as a build-operate-transfer project with foreign investment. Commissioned in June 1998, Nuon will operate the 24 MW wind farm for 20 years before transferring it to the local utility.

Nuon has a power-purchase agreement with the local utility for 6.5 cents/kwh during the first year, with annual increases of 3 percent over the next 10 years. This is the first project that includes a power-purchase agreement with a foreign company for a wind farm, agreeing to both pay hard currency and index the price to inflation.

After this project was implemented, however, approvals for wind farms of this scale were moved from the provincial government to the central government; no similarly commercial projects have been approved since.

New initiatives

The Chinese government has taken other important steps to expand the use of wind power, some with greater impact than others. The 10th Five-Year Plan proposes market-based policy instruments such as a mandated market share policy, also known as renewable portfolio standard, to promote renewable energy.

This policy would be a legal requirement that some share of electricity comes from renewable energy. A market-based instrument, such as trading of green certificates, would be introduced to share the incremental costs and benefits among the regions. However, the details on how such a policy can be implemented in China remain to be seen.

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[2] Total investment of US$210 million will support a 190 MW of wind power component for wind farms in Inner Mongolia, Hebei, Fujian and Shanghai. Other components of the World Bank/GEF project include rural electrification with 10 MW of standalone photovoltaic systems in northwestern China and a technology improvement component to increase quality of locally manufactured products.

In an effort to address both the competition and economies of scale issues, the SDPC announced in late 2000 that it would award five concessions for wind-farm development of up to 100 MW each. An international competitive bid would be held. Current plans would award winners with power-purchase agreements that would guarantee a power-purchase price for 15 years. SDPC hopes that the competition and large-scale development will result in costs lower than US$0.05 per kilowatt-hour.

Key incentives to build markets

Worldwide, 3,500 MW of wind capacity was installed last year, making wind the fastest-growing energy source. Global wind power capacity now stands at 17,000 MW.

Where wind power has flourished around the world, it has mainly been driven by policies that create a favorable climate for grid-access and purchase prices. In China, however, the market for wind power has developed more slowly than anticipated, largely due to a lack of a clear, consistent, streamlined framework for wind power, and incentives for wind developers.

Barriers preventing a more robust market for wind power in China include:

* **High costs:** Developers have been given little incentive to lower the cost of power produced at wind farms. Market competition is needed to trim costs and improve efficiency;

* **Limited wind resource-assessment data:** Project developers need more information about China's wind resources in order to minimize risk and choose the best sites;

* **Immature local-manufacturing capability:** China is strongly promoting local manufacturing capability for wind turbines. Greater economies of scale would lower costs, providing increased markets for these turbines;

* **Difficulty in securing project approval and negotiating power-purchase agreements:** Getting project approval from the central government and negotiating power-purchase agreements with the local utility may be the most difficult task for wind-power developers. These problems are not unique to the wind-power field and should become less burdensome as overall transparency within China improves;

* **Failure to account for the full environmental benefits of wind power:** China has become more serious in fighting its pollution problems. Additional environmental externalities associated with coal combustion should be accounted for to level the playing field; and,

* **Subsidized financing for imported wind turbines:** Soft loans from wind-turbine exporters may delay emergence of a commercial market in China. Wind projects that do move forward are limited to those that offer concessionary finance. In the long-run, it will be in the foreign manufacturers' own interest to eliminate these subsidies.

As costs continue to decline, wind power may soon be able to compete directly with other power sources in China, especially in regions where coal is expensive. Market-based incentives, such as a mandated market share policy or production tax incentives, appear set to serve the advancement of China's wind-power industry better than government-imposed development targets.

Over all, incentives are needed to overcome the barriers and accelerate the learning process of what might work best for China to create a sustainable market for wind power.

Promoting Green Electricity Development from Industrial to Developing Countries: What Needs to be Done?
Sinosphere Vol. 4 Issue 1 Winter 2001

Abstract
This article summarizes the need for a comparative analysis of green electricity development, and transfer useful experiences from industrialized to developing countries. It argues that green electricity has big potential for development in countries like China, if a favorable environment and policies are in place. It points out the problems in promoting green electricity in developing countries, and outlines the preconditions for cost-effective green electricity schemes to be developed and implemented in the developing world. It also lists the key questions to be answered through the research that can be relevant to public policymaking, and to design cost-effective programs for implementation.

The full article can be downloaded from the Professional Association for China's Environment website at www.chinaenvironment.net.

Cars May Be Banned From Central HK To Cut Pollution

Rueters News Service
9 January 2001

HONG KONG - Hong Kong plans to turn parts of its busy Central commercial district into traffic-free zones in a drive to improve its deteriorating air quality.

The proposal would see the closure of several major roads in Central to vehicles, and transport authorities have recommended limiting them to pedestrians only from later this year.

The plan would cover popular night-time districts Lan Kwai Fong and SoHo as well as part of Central's busy Queen's Road, and will be discussed in the local district council this week.

Air pollution in Hong Kong has stirred much concern in recent years. On bad days, a thick blanket of choking haze shrouds the famous Victoria harbour, sharply reducing visibility.

On Monday, the air pollution index (API) reached a very high level in dense districts of Central, Causeway Bay and Mongkok, with readings exceeding 140 in all three districts.

The Hong Kong government issues a standard warning urging people with respiratory and heart problems to stay indoors whenever the index rises above 100.

The government has made repeated pledges to combat the problem. Last November, the 60-member legislature decided by majority to raise the fixed penalty on smoky vehicles from HK$450 (US $58) to HK$1,000 (US $128).

Vehicles Emissions to be Regulated by State Government

ERM China/EHS Review
March 2001

The Chinese government announced on February 8th, 2001 the Approval Method on the Local Air Emission Discharge Standard of Vehicles. It is issued to comply with the stipulation on the Law of Air Pollution Prevention and Control, which requires the drafts of more stringent local standards will be submitted to the State Council for approval.

Rapid industrialization and rising incomes in China have led to a significant increase in vehicle ownership over the last decade. This has brought rising problems in air pollution. Vehicle emissions account for over 60 percent of the total air pollution in Beijing, Shanghai, Tianjin, and Guangzhou with NO_X and CO emissions on the main roads much higher than national discharge standards. To curb environmental degradation, the Chinese government is increasing its stance on this issue.

In March 1998, we saw governmental reforms and restructuring which resulted in a transfer of vehicle emissions control from the Ministry of Communications to the State Environmental Protection Administration (SEPA). The shift resulted in the total phase out of leaded gasoline in the country from 2000 onwards and the increase of stricter emission standards on light-duty vehicles requiring manufacturers to upgrade new productions with electronic fuel ignition systems and eventual installments of catalytic converters in new vehicles. Several new standards have also been established including the Emission Standard on Pollution Discharge from Light-duty Vehicles, and the Dangerous Substances Control Standard on Gasoline from Vehicles in 1999, and the Emission Standard on Exhaust Pollutants from Compression Ignition Engines of Vehicle in 2000. Some new vehicle emission standards are also in discussion.

Prior to the revised Air Law, provincial governments were given the authority to set up emissions standards without the approval of the state. However, many cities, having different interpretations of emissions standards, set their own standards without the approval of provincial governments. This created havoc on emissions standards nation-wide and created problems for vehicles manufacturers. The

new regulation, as aforementioned, will require provinces that need to meet mass loading control to apply for more stringent standards. All local standards previously established will be terminated after the installation of the new regulation. This new regulation will then allow the State government to base new standards on sound research and feasibility studies.

The efficiency of the State is yet to be seen, but in the short term, the increase in paperwork will reduce the efficiency of drafting new standards in individual provinces that require more stringent standards. However, a unified minimum standard throughout the country will probably be beneficial to the environment in the long run, as new state standards will be based on sound research by the government. Greater unity in nation-wide standards will also allow vehicles manufacturers to more easily specify specifications for new vehicles.

Government, Cities Set To Significantly Expand Subway Systems

(8 March 2001) The National Bureau of Statistics said that a large portion of 800 billion renminbi (US $96.62 billion) earmarked for urban transportation development would be used in constructing new subway systems.

China will build subways in at least five cities over the next five years, increasing the total number of cities with subways to 10 or more, according to a March 7 Xinhuashe (Xinhua News Agency) article.

Cities engaging in subway design and construction include Chongqing, Shenzhen, Nanjing, Wuhan and Qingdao, according to a statement given at the fourth session of the Ninth National People's Congress by Li Zibin, deputy director of the State Development Planning Commission. Also pondering construction are Shenyang and Suzhou.

In Nanjing, preliminary subway designs were approved in September 2001 and the Rmb 7.02 billion (US $848.25 million) system is set to commence operation in 2005, the article said.

China began building urban subways in 1965. Currently, Beijing, Shanghai, Tianjin and Guangzhou have subway systems.

CBUAutoEnews
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China's parliament last week approved the country's blueprint for economic development in the next five years. Maintaining an average 7 percent GDP growth per year, the country expects to increase its total GDP to 12.5 trillion yuan by 2005 at the 2000 price level. Highlights of the 10th Five-Year Plan (2001-2005) in relation to the transportation and automobile industry are listed as follows:

-Expand national highways to 1.6 million km in length, with a total of 25,000 km expressways;
-Develop agricultural machinery, civil ships and economy sedans;
-Raise the production level of motor vehicles and key automotive parts and components;
-Actively develop high-efficient, low-mission engine and hybrid engine systems;
-Remove all unreasonable rules that restrain or discriminate against investment;
-Protect the rights of all enterprises, regardless of ownership;
-Lift regional protectionism and remove all rules and regulations that hinder the formation of a unified market;
-Develop urban public transportation and encourage family ownership of cars;
-Reduce urban air pollution by 10 percent.

Strict Rules Abound In Shanghai's Driving Test, Licensing

Los Angeles Times
21 January 2001

SHANGHAI, China -- Want to drive in Shanghai? Better not be too short, weak in the arms, colorblind or suffering from high blood pressure, nervousness or an inability to jump into the air with bent legs and then land without wobbling. Most of all, you cannot have a missing or broken thumb. Otherwise your chances of sitting in the driver's seat in China's fast-paced economic capital will be nil.

Discrimination against bodily imperfections is probably the last thing foreign automakers anticipated in their desire to surmount China's prohibitive tariffs and the regulatory hurdles keeping them from affixing wheels to the world's largest car-less population. But as General Motors, Ford, Toyota, Volkswagen and a host of automakers begin to roll out cheaper compact cars on the eve of China's entry into the World Trade Organization, they may be surprised to learn of the separate hurdles many Chinese have to clear before being able to purchase a vehicle.

Since automobiles have only recently been resurrected in this Communist country as a politically correct object of desire, most people are adults by the time they sit behind a steering wheel for the first time. And what they must go through can seem incomprehensible by Western standards. Despite its relative wealth, for example, Shanghai has a very small pool of private car owners, lagging way behind those in Beijing and Guangzhou. From passing a driver's test to bidding for a license plate, this modern metropolis has some of the toughest restrictions in the country.

To start, there can be no fathers teaching sons to drive or friends teaching friends. Everyone has to register at an official driving school and fork over about $500 -- a hefty sum in a country with a per capita income in the neighborhood of $800. That covers roughly three weeks of classroom sessions, more than a month of behind-the-wheel training and three separate road tests. How you find the time to squeeze all this in depends on how nice your boss is and how many weekends you are willing to give up.

But before you can learn anything, you must pass a complicated physical exam that feels in equal parts like a trip through an amusement park and a tryout for astronaut training. At Shanghai's No. 2 Testing Center, about an hour from the city center, about 40,000 people jump through the hoops every year in hopes of snatching a driver's license. For the unlucky, it is an embarrassing way to learn they do not measure up. Li Fang is a 20-year-old student. Recently, she went to take the test with some friends and learned as she stood in her stocking feet that she failed to make the height requirement for a woman -- 1.5 meters, or slightly shorter than 5 feet -- by less than an inch. She arched her back and pulled on her neck like a yodeler. She begged two inspectors to verify the results. But it was a no-go. "My father wanted me to learn so he could buy me a car and let me drive him around," said the dejected Li as she laced up black shoes with thick rubber soles that would have easily put her over the top. "All I want to do is drive a small car, not a big truck. I had no idea they had this rule."

Down the hall, Fang Yonghua was sweating through his leather jacket. The 46-year-old laid-off watchmaker had a job offer as a chauffeur. He knew how to drive but did not have the proper paperwork. It took him two hours by bus to get to the testing center -- only to be rejected on sight. His right thumb did not meet specifications. "But I could fix watches and handle very detailed instruments. They didn't even give me a chance to prove what I could do. This is really not fair," Fang said as he haggled with the inspectors, who wore long white robes and insisted that rules are rules. As a teen-ager, Fang answered the call of Chairman Mao to "learn from the peasants and workers." He apprenticed at a factory, where a careless worker allowed a machine to cut him. He was only 16. Doctors fixed his wound by removing one of his big toes and attaching it to his thumb. The result does not look great. But Fang said it does everything he needs it to do, including grip a steering wheel, which he did when he worked briefly in New Zealand.

Even some of the staff at the testing center wonder how necessary it is to make driving candidates vault over a total of 14 obstacles. Those include: Lifting weights to show arm and hand strength. Sticking your head behind black velvet curtains to face blinding headlights, to see how well your vision adjusts. Pressing buttons with both hands and feet, as on a video game, to see how quickly you respond to visual and auditory stimuli. "I know overseas they only test your vision. Here in China, if you can't hear well in one ear, you can't drive. I think there's no need to be

that strict," said the woman operating an industrial-sized hearing booth.

Another inspector proudly declared that the machinery the center uses is state-of-the-art equipment from Japan. For example, if you are found to have high blood pressure, the staffers can give you a cardiogram on the spot and haul in a specialist to determine whether you are prone to strokes or just temporarily scared stiff by the exam. "Driving is a nerve-racking job. We cannot be lenient. If someone has a bad heart and gets nervous on the road, they could hurt themselves and the people around them," said Liu Junlan, the director of the center.

Rigorous as this system is, it is still easier to maneuver through than the path to vehicle ownership. In Shanghai, about 500,000 people now have licenses in their pockets but no cars. Buying one is easy, they say. The problem is, will you have enough cash left to buy the plates that allow you to get on the road?

Unlike other major Chinese cities, Shanghai's government sets a strict quota to control congestion on the streets. This year, the total of private cars in Shanghai grew by only 14,000 -- the same as the number of lucky people who placed winning bets at the city's monthly public auction for license plates. There you get one chance to make a secret bid, and if your price is too low, you must wait another month for another shot. Some experts say that Shanghai's population density and scarcity of land give the city no choice but to put the brakes on the speedy arrival of a car culture. "Like learning English and using computers, a driver's license is a must-have status symbol, especially for young people," said Zhu Weimin, a driving instructor who has seen his school's student body grow from a few dozen two years ago to more than 1,000 a year. "If the licenses were free in Shanghai, the streets would be paralyzed."

Move Over, Bicycle! China Falls In Love With The Car

Associated Press
Joe McDonald

SHANGHAI, China (AP)- Jia Zhengyi's face lights up as she tells how a new Volkswagen has changed her life.

A weekend escape from crowded Shanghai used to be an ordeal of trains, buses and luggage. Now, Jia and her husband hit the highway in their royal-blue Passat. Running errands with their 7-month-old son and his diaper bag are a breeze.

"We just put it all in the car," says Jia, a 28-year-old bank employee.

China is falling in love with the car. For the growing minority who can afford one, it's a fuel-injected, air-conditioned revelation, status symbol, business tool and social liberator.

The "bicycle kingdom" better known for its armies of two-wheeled commuters is entering a Golden Age of Driving. In China's version of 1950s America, the government is spending like never before on highways, broad urban avenues and landscaped expressways.

Nearly every foreign maker is trying to break into China's highly restricted car market. General Motors, Toyota and others are cranking up production here, promising lower prices and better selection.

The trend is feeding a surge in car-related businesses. Banks are dabbling in car loans. Drive-in movie theaters and private driving schools are springing up. Auto clubs offer emergency roadside repairs.

For China's cities, there is a dark side: traffic jams and some of the world's worst smog.

Yet the government wants more. It is considering trying to boost car sales with cheaper loans, lower taxes and regulatory changes.

A car is a dream beyond the reach of most Chinese, costing up to fifty times the average urban wage of $750 a year.

But a surprisingly large number of entrepreneurs and professionals, the chief beneficiaries of two decades of capitalist-style reform and surging urban incomes, are splurging on new wheels.

Only a tiny share of China's 1.26 billion people drive. But the number of private cars is growing by 30

percent a year, with 3 million already on the road, the government says.

Sales to the new rich in the booming financial center of Shenzhen, near Hong Kong, are climbing by 200 percent a year, according to state media. General Motors, which set up production in China to avoid high import taxes, has taken deposits from 15,000 buyers for an inexpensive family oriented sedan. The Sail, based on an Opel model sold in Europe, will be available beginning in April.

Jia and her husband, Wang Xiaolan, bought their Chinese-made Passat in December for $37,000, thanks to a bank loan and their salaries as members of China's professional elite. Wang uses the car as a salesman for a Singaporean-owned marine services company in Shanghai's port.

"I couldn't do my job without it," says Wang, a driving pioneer who got his license in 1991 to improve his chances of finding work.

Even Chinese without cars can answer the call of the open road, thanks to rental agencies in bigger cities. French automaker Citroen is reportedly considering starting China's first nationwide rental chain.

It's a dangerous love affair. Though China still has relatively few cars, its crowded cities are choking on traffic.

Beijing's narrow lanes are stuffed with honking, exhaust-belching traffic at rush hour. A police radio station broadcasts bulletins on how to avoid chronic congestion. In the countryside, roads are devouring scarce farmland, environmentalists warn.

Driving in China isn't for the faint of heart.

Most drivers have only a few years' experience. Many drive as if they were still cycling, weaving from lane to lane without signaling and frightening crowds of pedestrians. Drivers run red lights and park on sidewalks.

Thousands drive on licenses bought from corrupt officials or obtained through personal connections. News reports on fatal crashes often note the driver didn't bother getting a license at all.

In Shanghai, traffic accidents kill an average of four people a day, police say. The city of 13 million people reported 41,262 crashes last year.

Photographer Zhao Bendi has turned his asphalt angst into art. In a self-portrait shown at the Shanghai Art Museum this winter, Zhao lies in the street surrounded by taxis spewing exhaust. A cartoon speech bubble above his head cries out: "I was poisoned! Avenge me!"

Shanghai, one of the world's most crowded cities, is fighting traffic paralysis with a mix of taxes and rules to discourage car buyers. The strategy is unusual for a city that, with factories for GM and Volkswagen, qualifies as the Detroit of China.

The city has turned a seven-block stretch of its main avenue, Nanjing Road, into a pedestrian mall lined with shops and restaurants. To cut demand for buses and taxis, train travelers arriving at Shanghai Station get a free subway ride.

Shanghai also throws up roadblocks for driver's license applicants with high fees and multiple written and behind-the-wheel tests.

Jia and her husband, Wang, are undaunted. They already talk of getting their son into one of the Shanghai high schools that teach American-style driver's education classes.

And Jia is studying for her own license.

"Now that we have a car, it's just something I have to do," she says.

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The Beijing Municipal Government plans to enforce the Euro II emission standards starting from January 1, 2004, earlier than expected. Such standards will become the national standards starting from 2005.

They Paved Pears and Rice and Put Up a Parking Lot
Pavement Is Replacing The World's Croplands

Grist Magazine
1 March 2001

As the new century begins, the competition between cars and crops for cropland is intensifying. Until now, the paving over of cropland has occurred largely in industrial countries, home to four-fifths of the world's 520 million automobiles. But now, more and more farmland is being sacrificed in developing countries with hungry populations, calling into question the future role of the car.

Millions of acres of cropland in the industrial world have been paved over for roads and parking lots. Each U.S. car, for example, requires on average 0.18 acres of paved land for roads and parking space. For every five cars added to the U.S. fleet, an area the size of a football field is covered with asphalt.

More often than not, cropland is paved simply because the flat, well-drained soils that are well suited for farming are also ideal for building roads. Once paved, land is not easily reclaimed. As environmentalist Rupert Cutler once noted, "Asphalt is the land's last crop."

The U.S., with its 214 million motor vehicles, has paved 3.9 million miles of roads, enough to circle the earth at the equator 157 times. In addition to roads, cars require parking space. Imagine a parking lot for 214 million cars and trucks. If that is too difficult, try visualizing a parking lot for 1,000 cars and then imagine what 214,000 of these would look like.

However we visualize it, the U.S. area devoted to roads and parking lots covers an estimated 61,000 square miles, an expanse approaching the size of the 51.9 million acres that U.S. farmers planted in wheat last year. But this paving of land in industrial countries is slowing as countries approach automobile saturation. In the U.S., there are three vehicles for every four people. In Western Europe and Japan, there is typically one for every two people.

In developing countries, however, where automobile fleets are still small and where cropland is in short supply, the paving is just getting underway. More and more of the 11 million cars added annually to the world's vehicle fleet of 520 million are found in the developing world. This means that the war between cars and crops is being waged over wheat fields and rice paddies in countries where hunger is common. The outcome of this conflict in China and India, two countries that together contain 38 percent of the world's people, will affect food security everywhere.

Car-centered industrial societies that are densely populated, such as Germany, the United Kingdom, and Japan, have paved an average of 0.05 acres per vehicle. And they have lost some of their most productive cropland in the process. Similarly, China and India also face acute pressure on their cropland base from industrialization. Although China covers roughly the same area as the U.S., its 1.3 billion people are concentrated in just one-third of the country -- a thousand-mile strip on the eastern and southern coast where the cropland is located.

If China were one day to achieve the Japanese automobile ownership rate of one car for every two people, it would have a fleet of 640 million, compared with only 13 million today. While the idea of such an enormous fleet may seem far-fetched, we need only remind ourselves that China has already overtaken the U.S. in steel production, fertilizer use, and red meat production. It is a huge economy and, since 1980, also the world's fastest growing economy.

Assuming 0.05 acres of paved land per vehicle in China, as in Europe and Japan, a fleet of 640 million cars would require paving nearly 32 million acres of land, most of which would likely be cropland. This figure is over half of China's 56.8 million acres of rice land, part of which it double-crops to produce 135 million tons of rice, the principal food staple. When farmers in southern China lose an acre of double-cropped riceland to the automobile, their rice production takes a double hit. Even one car for every four people, half the Japanese ownership rate, would consume a substantial area of cropland.

The situation in India is similar. While India is geographically only one-third the size of China, it also has more than 1 billion people, and it now has 8 million motor vehicles. Its fast-growing villages and cities are already encroaching on its cropland. Add to this the land paved for the automobile, and India, too, will be facing a heavy loss of cropland. A country projected to add 515 million more people by 2050

cannot afford to cover valuable cropland with asphalt for roads and parking lots.

There is not enough land in China, India, and other densely populated countries like Indonesia, Bangladesh, Pakistan, Iran, Egypt, and Mexico to support automobile-centered transportation systems and to feed their people. The competition between cars and crops for land is becoming a competition between the rich and the poor, between those who can afford automobiles and those who struggle to buy enough food.

Governments that subsidize an automobile infrastructure with revenues collected from the entire population are, in effect, collecting money from the poor to support the cars of the wealthy. In subsidizing the development of an auto-centered transport system, governments are also inevitably subsidizing the paving of cropland. If, as now seems likely, automobile ownership never goes beyond the affluent minority in developing countries, this becomes an ongoing and largely invisible transfer of income from the poor to the rich.

Future Schlock

In a land-hungry world, the time has come to reassess the future of the automobile, to design transportation systems that provide mobility for entire populations, not just affluent minorities, and to do this without threatening food security. When Beijing announced in 1994 that it planned to make the auto industry one of the growth sectors for the next few decades, a group of eminent scientists -- many of them members of the National Academy of Sciences -- produced a white paper challenging this decision. They identified several reasons why China should not develop a car-centered transport system, but the first was that the country did not have enough cropland both to feed its people and to provide land for the automobile.

The team of scientists recommended that instead of building an automobile infrastructure of roads and parking lots, China should concentrate on developing state-of-the-art light rail systems augmented by buses and bicycles. This stategy would not only provide mobility for far more people than a congested, auto-centered system, but it would also protect cropland.

There are many reasons to question the goal of building automobile-centered transportation systems everywhere, including climate change, air pollution, and traffic congestion. But the loss of cropland alone is sufficient. Nearly all of the 3 billion people to be added to the current world population of 6 billion by mid-century will be born in developing countries where there is not enough land to feed everyone and to accommodate the automobile. Future food security now depends on restructuring transportation budgets -- investing less in highway infrastructure and more in rail and bicycle infrastructure.

CBUAutoEnews
Vol. 2, No. 15. April 12, 2001

China's first electric bus is expected to be put in use inside the Beijing Economic and Technological Development Zone in May. Emission of the bus has reached the Euro V standard, Such buses will be popularized in European countries by 2008. China's electric bus costs about one tenth of an imported model.

300 new buses powered by natural gas recently went into operation in Shanghai. The new buses are more spacious than the old ones and the steps of these new buses are lowered for the convenience of elders and the handicapped.

CBUAutoEnews
Vol.2, No.17. April 26, 2001

China recently issued two state standards for hybrid fuel: *Ethanol as Alternative Fuel* and *Ethanol for Motor Vehicles*. Ethanol-gasoline mix is an alternative fuel that will partially replace gasoline. The two standards are mandatory. The new regulations are meant to standardize the use of ethanol-gasoline, which is being promoted as an environmental friendly and alternative fuel by the government.

Beijing recently lifted its ban on diesel vehicles operating inside the city. According to the new regulation, diesel vehicles that meet the Euro I emission standard can now operate in the city.

The Pearl River Delta: Where Owning A Car Is Cheap, Easy And Increasingly Popular

(5 February 2001) The prosperous medium-size cities in China's Pearl River Delta such as Shunde, Nanhai, Zhongshan, Fanyu and Dongguan are at the forefront of the latest wave of car buying, with sales booming last year.

Take Shunde, for example. According to the Jan. 31 Xin Kuai Bao (News Express), car ownership rose 200 percent from last year, to one car for every 8.3 families, far higher than the national and provincial average.

Compared to the slow pace of car consumption in big cities such as Guangzhou and Shanghai, why is car buying the rage in small to medium size cities in the Pearl River Delta?

Industry insiders point to low parking fees, high quality of life and convenient transportation as the key reasons.

In large cities like Guangzhou, it is easy to buy a car but very difficult to keep one, with high taxes, tolls and parking fees. For example, parking charges in Guangzhou can add up to more than 1,000 renminbi (US$120.96) a month. This has seriously hindered car consumption.

Driving Utopia

These problems do not exist in the cities in the Pearl River Delta, where there is plenty of public parking, and most families have their own garages. Lack of traffic congestion also enables people to enjoy the convenience of owning a car. Furthermore, the quality of life and level of income in these cities are generally high while the cost of living is quite low.

Experts predict that the market for cars in the Pearl River Delta will heat up as the Chinese government introduces measures to encourage car buying, and as more economy cars are built. It is estimated that there will be one car for every two to three families in cities like Shunde and Nanhai by 2005.

Graphic by S. Mita

The sales-to-production ratio for automobiles reached 102 percent in 2000, with 2.06 million cars produced and 2.1 million sold, up 13 percent and 14 percent respectively from the previous year. The number of cars sold rose 7 percent from the previous year whereas the number of trucks sold grew 3 percent, the story said.

CBUAutoEnews
Vol. 2, No 1. January 4, 2001

The National Environmental Protection Agency and Volkswagen AG signed a comprehensive memorandum of cooperation in automobile emission control last December. According to the memorandum, the German automaker will help China build its emission control system by providing technical assistance, financial aid and specialists who will work in China. The cooperative project will continue until the end of 2002.

Hong Kong Chokes On Smog

22 February 2001
Michael Bociurkiw
MSNBC Contributor

HONG KONG, Feb. 22- In a move that astounded his friends and colleagues, Nick Thompson abandoned Hong Kong after 11 years of living and working here and moved his family across the South China Sea to Manila. One of the main reasons for the relocation: Hong Kong's worsening air pollution.

Thompson concedes most people associate Manila with choking air pollution, but he insists the air in Hong Kong is worse.

"I realized when I came over to Manila that I could actually see the stars at night. I don't remember the last time I saw stars in Hong Kong, "says Thompson, a senior executive with the Philippine Long Distance Telephone Company.

There's been a really serious deterioration in Hong Kong's air quality over the past two years or so. Due to weather conditions, this time of the year is when the haze gets almost impossible to ignore, and the complaints by local and expatriate residents becomes ever more bitter. There's no shortage of official statistics to confirm that Hong Kong is shrouded by some of the most poisonous air in Asia. And the problem is hitting Hong Kong where it hurts – in business, tourism and quality of life. According to the territory's Environmental Protection Department, the level of particulates breathed by Hong Kong residents approaches that of famously choked-off Taipei. The level is far higher than in traditional manufacturing centers such as Detroit and Chicago, and almost double the amount of competing Asian financial center Singapore. Hong Kong's location, sandwiched between hills on Hong Kong island and the Kowloon Peninsula, makes the problem worst in its most densely populated areas.

"We are very cramped and pollutants can't be dispersed easily," says Thomas Chow, deputy secretary of the city's Environment and Food Bureau.

GOVERNMENT MEASURES

The Hong Kong government only got serious about fighting air pollution well after the British handed the territory back to China in 1997. Since most of the pollution has been traced to diesel vehicles - they account for 70 percent of the total kilometers driven on Hong Kong roads - the government's war on air pollution has centered on fume-spewing taxis and trucks. The tiny city has about the same number of cars as the sprawling Seattle area, and about 12 times the population. But critics say the government's measures, which include subsidizing taxi owners to convert their 18,000 vehicles from diesel to LPG and raising road and licensing taxes, don't go nearly far enough. The owners of vehicles spewing black smoke, for example, face fines of only $129. And many taxi drivers are believed to flout a ban on cheap diesel by purchasing supplies smuggled from China. Moreover, ambitious road-building plans - backed by a powerful transport lobby - promise to vastly increase the number of vehicles on local roads. The long-term trends indicate that air pollution will be worse in 2016 than it is today ˜ even with LPG taxis and cleaner petrol, said Lisa Hopkinson of the non-profit research organization Civic Exchange.

CHINA FACTOR

Just as much of Hong Kong's wealth is traceable to growing trade between mainland China and the West, so too is much of the city's pollution. About 30 percent is generated nearby in China's booming Guandong province, where factories and coal-fired power plants spew untold millions of tons of pollution into the sky. To help stem the problem, Hong Kong created a joint study on air pollution with the provincial government. Its first report is due in March. Already, the government's Chow says, Guangdong's capital, Guangzhou, has launched significant greening projects.

But few expect drastic actions from the world's most populous nation. Ely Ouano, the senior environment specialist at the Asian Development Bank, said China can't be expected to change its polluting ways overnight. "It is such a big country and it's doing it one step at a time. To do it in one go would create a very serious drain on resources."

Breathless in the Port City

But Hong Kong, long one of the most advanced, cosmopolitan cities in the Asia Pacific, is paying a price for air pollution in a lower quality of living. Locals and expatriates alike are quick to sound off about the nasty side-effects: burning throats, rashes, red eyes, asthma and fatigue.

Plato Yip, of the environmental group Friends of the Earth, puts the number of asthma cases in Hong Kong at a staggering 400,000 and says as many as 2,000 people die a year due to poisonous air. For many days in 1999 and again in 2000, the air quality deteriorated to the point there the elderly and children were warned to stay indoors. Hong Kong's famous skyline now frequently disappears behind smog. A regional advertising executive says he has checked himself into the hospital more than once for breathing difficulties. Anyone who is a parent here has to be scared for his or her kids, he said.

BUSINESS

So far, tourists perceptions of Hong Kong haven't changed much because of the pollution, according to the Hong Kong Tourism Association. Our air pollution problem is on a seasonal basis, said spokeswoman Donna Mongan, citing surveys. Tourism generates about 5 percent of the city's gross domestic product. As Hong Kong's skies become obscured it's becoming tougher for this prosperous city of 7 million to attract overseas workers and foreign investment - not a good development at a time when the city is facing increasing competition from the likes of Singapore and Shanghai and trying to re-engineer itself as a haven for dot-com companies.

"Many tourists and business visitors are going away with an impression of Hong Kong as dirty, polluted," says Robert Law, director of the city's Environmental Protection Department.

"Businessmen are unlikely to set up businesses here if their family's health will be at risk" says American expatriate Bob Broadfoot, director of Political and Economic Risk Consultancy. "The types of companies coming to Hong Kong are more sensitive to pollution and they are bothered by air pollution."

Sources say that when the Disney Co. began considering Hong Kong for its newest theme park, its American executives read the riot act to the local government, saying the $2.6 billion project would only proceed if something was done to clean up the environment. Dirty air might have also been a factor in Hong Kong's losing its bid for the Asian Games in 2000.

Airborne Pollutant Level Down In Beijing

(9 February 2001) Since 1998, Beijing has earmarked nearly 30 billion renminbi (US $3.62 billion) for the implementation of air pollution control measures. A recent People's Daily report says the investment already has paid off: air quality in the Beijing metropolitan area has improved substantially.

In the past 2 years, the density of major airborne pollutants has been decreasing in Beijing. In 2000, the density of airborne sulfur dioxide, carbon monoxide, nitrogen monoxide and total suspended particles were down by 41 percent, 21 percent, 18 percent, and 7 percent, respectively, from the 1998 levels, according to a Feb. 5 *Renmin Ribao* (People's Daily) report.

In order to reach the goals set in the national environmental quality standards for the year 2002, Beijing has taken the following environmental control measures:

1. Extending the use of clean fuels, such as natural gas, electricity, and low-sulfa high-quality coal;

2. Establishing local emissions standards for motor vehicles that are stricter than the national standards, completely adopting unleaded gasoline, installing catalytic converters on 180,000 motor vehicles, converting 20,000 taxis and public buses to clean fuels, and raising the rate of motor vehicles that meet emissions standards to 90 percent;

3. Preventing dust pollution in the Beijing metropolitan area and raising the proportion of the city covered by parks and green areas to 36 percent;

4. Gradually shutting down or relocating Beijing-area industrial enterprises that generate heavy pollutants; and

5. Renovating the central water system in Beijing's urban area and strengthening protections on water resources, the story said.

Hoping The Olympics Committee Will Breathe Easier, Beijing Freshens Up Again

(9 January 2001) In its efforts to woo the International Olympic Committee into sending the 2008 Summer Games to China, the country's capital is instituting several new air-pollution measures that aim to limit restaurant pollution and vehicle emissions.

The "Measures on Implementing 'The Law on Air Pollution Prevention and Control of the People's Republic of China' " were issued on January 5 by the Beijing Municipal Bureau of Environmental Protection, according to an article in the January 6 Zhongguo Huanjing Bao (China Environment News).

The rules state that no restaurant producing smoke pollution will be allowed to conduct business on the first floor of residential buildings in Beijing. Also, in cooperation with the traffic administration department, the environmental protection authorities at the city and district level will conduct random emission checks of vehicles on the road.

The city government will restrict certain types of vehicles from being driven and limit some vehicles' running hours. Any vehicle whose emissions exceed the stipulated standard will either be banned from the road or thrown on the scrapheap, by order of the traffic administration department.

Paying the price

The measures represent a stricter version of the "The Law on Air Pollution Prevention and Control" and, thus, carry stronger punishments.

According to Article 33, if a pollutant-discharging enterprise refuses a city mandate to shut down or partly shut down its production operations, the government will shut off the enterprise's power and water supplies. The municipal environmental protection authority may also levy a fine to the tune of 10,000 renminbi to 100,000 renminbi (US $1,207.73 to US $12,077.30).

This is just the latest drop in a flood of environmental regulations surrounding the pollution-plagued metropolis. According to an October 31, 2000, article in the Beijing Youth Daily, the municipal government passed measures that confined drivers to either odd- or even-number dates when driving Beijing's major highway, Fourth Ring Road.

Also in that article, the Beijing Environmental Protection Bureau announced that a series of random emission checks would be performed on enterprises that had already achieved discharge standards, then 99.2 percent of Beijing's 5,013 enterprises.

In one of the city's most peculiar decisions during its vigorous campaign for the Olympic gig, officials announced that all new constructions must sport a gray exterior. The move, not only a nod to the city's centuries-old monochrome aesthetic, would also help camouflage the effects of air pollution, the October 30 Zhongguo Xinwen She (China News Service) reported.

The Sixth Stage of Beijing's Air Pollution Control Program

ERM China/ EHS Review
April 2001

On April 1st, 2001, the Sixth Stage of Beijing's Air Pollution Control Program began. This aims to ensure 50% of Beijing's days reach Grade II air quality levels or better. The following measures are key focuses:

-Vehicles are required to use green or yellow labels. A vehicle with a green environment friendly label attached to it means the vehicle has passed the new examination standard. Vehicles with yellow labels comply with the old emission standards, and are to be tested twice a year.
-By the end of August 1st, 2001 vehicles without the above two labels will be prohibited from the roads. ·
Air quality forecasts will be made public beginning from May 1st , 2001.