



The China Sustainable Energy Program
中国可持續能源项目

C H I N A C L I P P I N G S
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This issue opens with a two-part interview in EV World Magazine with Douglas Ogden, Program Director of the China Sustainable Energy Program, who discusses China's efforts to promote energy efficiency.

A recent report by the Lawrence Berkeley National Laboratory (LBNL) announced that China's carbon dioxide emissions have dropped 17 percent since the mid-1990's while its GDP grew by 36 percent, making China a leader in addressing energy efficiency and climate change issues (pg. 6). However, there is debate to the accuracy of these findings. Jonathon Sinton, scientist at LBNL, addresses the dispute in the *Beijing Environment, Science and Technology Update* on page 8.

Chinese companies are incorporating more environmental considerations into their business practices. Companies wishing to compete in the global market, face pressure from international environmental groups to clean up their act, and are adopting a Health, Safety and Environment (HSE) Management System to avoid potential fines and lawsuits (pg.13).

In the transportation sector, China is unifying its auto emission standards, and hopes all motor vehicles will meet international emission standards by 2010 (pg. 17).

Now that Beijing has been chosen as the host city of the 2008 Summer Olympics, China is under pressure to improve the city's air and water quality, add green space, and improve transportation (pg. 20). The Beijing Municipal Environmental Protection Bureau passed a measure which will allow the city government to cut off power and water and fine businesses that do not comply with pollution control laws (pg. 21).

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大卫与露茜·派克德基金会 合盟
能源基金会

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Energy Foundation Encourages Efficiency In China

EV World
13 May 2001
Bill Moore

Part I on an interview with Douglas Ogden, Project Director.

Headquartered on the beautiful grounds of San Francisco's Presidio, near the fabled Golden Gate Bridge is the Energy Foundation, a non-profit, non-governmental philanthropic organization whose mission is to promote a wiser, more sustainable use of energy, not just in the United States, but worldwide.

For the past two years, the Foundation has administered the China Sustainable Energy Program, which is funded in the David and Lucille Packard Foundation. David Packard is the co-founder of Hewlett Packard, the computer technology giant. The family's support of the project is a result of David Packard's business and personal interests in China.

"Our mission is to assist in China's transition to a sustainable energy future by promoting energy efficiency and renewable energy policy," explained Douglas Ogden, the project's director. Ogden not only oversees the project's San Francisco office, but an office in Beijing, China as well. He lived for a number of years in China in the early 1980's and has witnessed the steady environmental degradation of the nation with its rapid industrialization.

The nation's air and water pollution problems haven't gone unnoticed by the nation's leadership and according to Ogden, both the cities of Beijing and Shanghai have made significant strides in the last two years to improve their respective air qualities. However, despite its progress, Beijing especially suffers periodic episodes of choking air pollution, more than half of which is caused by motor vehicles.

One of the more recent initiatives to reduce automotive emissions is the adoption of European emissions standards. Many of the vehicles available in China are build under license from both European and American car companies, VWs, Jeep and Buicks are popular and built in China. But until recently, they were not required to have emission controls. That has now changed, Ogden reported. The Chinese are currently implementing Euro I standards and plan to move on to Euro II in the next three to four years.

For its part the China Sustainable Energy Program is funding a number of studies both in China and in the

US that are looking at ways for China to improve its energy efficiency, both in the transportation sector and well as in energy production and utilization. The Project also serves as a bridge between East and West, Ogden stated.

"We serve as a bridge to the international policy community to provide best practices of other kinds of energy efficiency and renewable energy policies that have been developed in other countries, and to help bring experts from those countries to China. They then help co-author papers with Chinese energy policy experts, develop workshops, create a schedule for developing policies in China that are tailored to China's own circumstances, and then ultimately present these policy recommendations to China's government decision makers."

China: A Nation With A Plan

According to Douglas Ogden, 78% of China's electricity comes from the burning of coal. So, we asked him what the nation was doing to improve the efficiency of its fossil fuel generation system and/or shift to cleaner, less polluting fuels and sources.

He said that China has had an official energy efficiency policy in place since the early 1980s and that policy has been an integral part of every Five Year Plan since then. The 10th Five Year Plan, which was adapted last April, has set as its goal a 2.5% increase in "energy intensity" yearly until 2010. Ogden explained that energy intensity is, "the amount of energy required to produce a dollar of economic output." He added that the leadership has set a target for the nation that by 2050 it will be 100% more efficient than the average developed country today.

"More than any other developing country today, China has adopted energy efficiency as its center piece."

China did this because it realized, Ogden elaborated, that it couldn't afford to achieve its four major modernization goals of quadrupling its economic output in agriculture, manufacturing, science & technology and the military by 2000.

"In 1980, they looked at the energy requirements for accomplishing the four modernizations and realized that they just could not do it with the amount of available capital without having to sell off the entire electricity sector to the West or borrow too heavily from other sectors to make reaching the four modernizations possible."

Ogden said that because China already has an infrastructure and decision making process in place that appreciates the need for energy efficiency, it makes his job much easier.

"It's a real pleasure to work with the Chinese because we don't have to convince them about the wisdom of energy efficiency and renewable energy."

China: Risks Repeating the West's Mistakes?

In addition to its efforts to clean up the emissions of its burgeoning fleet of private and government owned motor vehicles by the adoption of Euro I and Euro II emission standards, China also has allocated US \$10 million for alternative vehicles R&D with the focus on hybrid-electric and fuel cell vehicles.

"China has a fairly robust fuel cell R&D effort underway in a number of its major universities," Ogden stated. "They've been interested in fuel cells for a couple decades. They're focusing on moving to the next step of bringing fuel cells into vehicle technology."

But for all China's interest in cleaner vehicle technology, they appear headed down the same culdesac as the West with an economy increasingly shaped by the private motor vehicle.

"I think there is a real risk of China repeating the mistakes of the West," Ogden said. "And transportation system planning and reform is critically important. In the cities they have made substantial progress on air quality but traffic is worse. It's worse due to ring road planning and they are no longer encouraging works to live at the work site. So, the Chinese are becoming car dependent and the automobile has been designated a key industry for

China's economic growth and development. And bicycles now are being actively discouraged in China's transportation system planning."

"Urban planners are planning for cars and not for serving the public good or moving people most efficiently and effectively. They need to focus on efficient bus fleets and we're encouraging a bus fleet based on the hybrid-(electric) platform similar to the systems in Curitiba, Brazil that moves people at 3% of the cost of a subway system."

"That said, Beijing sees itself as China's most important city, its showcase city and it is developing a system of subways. Nevertheless, people are moving out of the inner city. They are moving out into cheaper areas. The automobile is coming in reach economically for individuals and families which have received higher education and are pushing for their economic advancement."

Ogden explained that Chinese officials have traveled extensively in the West and noted the central role that automobile plays in the economy of the West and they want to emulate that.

"They go down a main street in the United States and they see how many businesses are affiliated with the production of automobiles, tire manufacturers, parts stores, mufflers and so on and that kind of vision is becoming the same vision in China. It is a solid concern."

"We're trying to encourage a more balanced, multi-modal transportation approach." Because of budgetary constraints, the Foundation is focusing in on ways to reduce emissions, as well as encouraging a leap-frog approach to the very cleanest vehicle technologies, one that would "move past the internal combustion engine phase and straight to hybrid-drive and eventually fuel cells."

He added that if the Project had the resources it would also tackle the systems planning approach with China."

China Rises to Efficiency Challenge

EV World
 20 May 2001
 By Bill Moore

China has set itself some ambitious energy efficiency and renewable energy goals for the next two decades in an effort to stem its rapidly mounting GHG emissions, second only to the US.

Part II of an interview with Douglas Ogden, Project Director.

China has the world's second most carbon-intensive economy after the United States. It also is home to more than a billion human beings with growing aspirations for many of the goods and services long enjoyed by the West, including cars and air conditioning.

If the Chinese, with 20% of the world's population -- someday approach the per capita energy consumption of the average American, the world will be in serious trouble environmentally, and in all likelihood, geopolitically. Today, China emits 11% of all the carbon dioxide emitted worldwide, surpassed only the United States at more than double this amount annually (25%).

"China is on a much faster carbon trajectory (and is) likely to surpass the US in carbon emissions by 2020, although the Chinese dispute this," stated Douglas Ogden, the director of the China Sustainable Energy Program. They have an aggressive energy efficiency policy, so they don't see overtaking the US for quite some time."

"But you now the atmosphere is a global commons and what China puts into the atmosphere is challenging the integrity of the air the whole planet breathes, and similarly for the United States," Ogden told EV World.

"We as a foundation spend 75% of our resources in the United States. So we feel the United States needs to step up and take responsibility first for these problems, and take a leadership role by encouraging the kinds of efficiency and renewable energy technologies that can be the cost effective solution to the changing chemistry of our atmosphere."

Meanwhile At the White House...

Even before the Bush Administration's National Energy Plan was unveiled this week (though there have been numerous hints and deliberate leaks along the way), Ogden commented on what he saw as "retrograde" policies emanating from 1600 Pennsylvania Avenue.

"We try to do what we can to raise the profile of energy efficiency technology. You know the current administration is focusing on conservation and shutting things off rather than realizing there's a real revolution that's underway in more efficient technologies and we need to encourage those technologies into the marketplace. We need a national energy efficiency policy more than we need a kind of fossil supply policy."

Aiding A Potential Adversary?

"Let me say that the Energy Foundation's program deals solely with clean energy technology policy," Ogden commented when asked about the growing mood among conservative American politicians that China is a political and military adversary that we need to be weary of. "These political questions are not really in the purview of what we do," he replied.

However, Ogden was willing to share his personal views of the Chinese people, in general. "I don't see China as seeking hegemony in the world. China's defense spending, although growing, is twenty times less than US defense spending. So, in terms of looking at China as a potential adversary and leading towards military conflict, I am hopeful that we have cooler heads than that and that our policy makers in the United States will view China as a business partner more than a political adversary.

"China has had a long period here where it has had an economy that hasn't been growing very quickly. It feels behind in the world. It is taking sometimes unfair, unreasonable approaches to try to get ahead competitively to improve its economic standing in the world and improve development for its people.

"China's people are poor. The per capita income averages US \$870 per year. The United States is at US \$30,000. China wants to catch up. So China does have this competitive drive to get there and we should acknowledge that. We should be helpful to China's development by engaging in fair trade. But China also needs to understand that the rule of law must define its development. To the extent the United States can engage China and encourage its legal

reform so that it has transparent commercial laws, transparent accounting standards - - the kinds of things that are necessary for building a competitive economy - - those are fruitful areas of engagement and I hope that we'll try to give those highest priority over the more militaristic discussions we've been hearing.

China Highly Appreciative

According to Ogden, the Chinese with whom the Project deals are highly appreciative of its efforts in their behalf. "They find that our policy focus is very useful to government decision makers, helping them attain their energy efficiency goals. The Chinese wish there were more programs like ours." He added that the Europeans have begun to participate in similar bilateral programs, as have the World Bank and the United Nations Development Program.

"But the Chinese have been miffed by the anemic financial commitments of the US Government to deliver good energy efficiency and renewable energy programs to China. The United States Government as entered a number of commitments to deliver US Environmental Protection Agency and Department of Energy efficiency programs to China, but the Congress has not allowed the kind of funding necessary to back up those commitments. And so the United States has a lot of work to do. And there is a lot of fruitful ground to play with the Chinese to encourage these kinds of policies that in turn can build the kind of robust efficiency and renewable energy market that can benefit US industry, as well as the domestic industry in China."

Is Renewable Energy Really Up to the Task in China?

EV World pointed out to Ogden that the Three Gorges Dam currently under construction in China, despite being the world's largest hydroelectric project when completed, will still only meet about 3% of the nation's electricity needs. The obvious question then is can renewables really play a meaningful role in China -- and by extension elsewhere in the developed and developing world?

He responded by first admitting that projects like the Three Gorges Dam have often not benefited from careful economic scrutiny. "Economics as a discipline in China has a ways to go, so that people are really looking at costs and benefits of these mega-projects.

"The wind energy potential in China is huge," Ogden pointed out. "China could power its entire country with the amount of wind that's blowing through Inner Mongolia and a lot along the whole belly area of China, Fujian and Guangdong. Wind in this country, in the United States is the fastest and now cheapest and cleanest form of new energy. There are a number of wind energy companies that would like to do business in China. China would like to develop its own domestic industry. It's committed to increasing the capacity of renewable energy over the next decade sixteen-fold. So China is moving ahead aggressively. It does have a long way to go.

"It has a very solid, small wind turbine industry. China is a major exporter of small wind turbines throughout Asia," Ogden pointed out. He added that they would like to manufacture even larger units in the 650kW range.

Despite the Bush Administration's contention that wind energy is not as economical as fossil fuel-generated electricity, Ogden and many others contend this is not true. He cited examples where long term contracts are being signed today in the US for electricity from wind farms at rates as low as 4 cents a kilowatt hour.

Not only does wind energy have great promise in China - - and elsewhere - - solar energy also looks promising. The nation is developing a fairly good photovoltaic panel manufacturing infrastructure, though Ogden suggested there is still room for improvement in the quality of the final product. (Editor's note: We charge EV World's Currie electric bicycle with a pair of Chinese-made 5watt PV panels. We paid the equivalent of US \$5/Watt for them last winter).

Measuring the Project's Progress

The China Sustainable Energy Program measures its success in terms of the amount of energy saved and new renewable energy mega-watts built.

"Our aim is an ambitious one," he said. " To encourage a regulatory framework in China to encourage these markets in efficiency and renewable energy technology." While he readily admits that he doesn't yet have the numbers to point to, Ogden did say that the Project was instrument in helping China develop a new air conditioning efficiency standard. This was an important milestone for the project because China is the world's largest air conditioning manufacturer.

"Just the next five years anticipated growth in air conditioner usage in China will absorb the entire output of the Three Gorges Dam. So, the new air conditioner standard which (sic) improves efficiency 22% will displace a dozen large coal-fired power plants over the next decade or so."

"Nevertheless, this undertaking is a large one, it's a hard one. There is great, world-class work going on in Beijing, Shanghai, some of the other major cities, but getting policies to become effectively implemented in the provinces is our greatest challenge."

The New York Times

ON THE WEB

China Said to Sharply Reduce Carbon Dioxide Emissions

New York Times
15 June 2001
Erik Eckholm

BEIJING, June 14 - In the debate on global climate change it has long been a given that China, with its huge population and endless coal reserves, would overtake the United States early this century as the biggest source of the atmospheric pollution that scientists believe is warming the planet.

That specter of runaway Chinese emissions has been cited by President Bush as a major reason for describing as "fatally flawed" the 1997 Kyoto agreement to protect the climate. The treaty exempts developing countries, including China, from its initial, binding limits on the output of carbon dioxide and other so-called greenhouse gases that scientists believe are causing traumatic changes in the climate.

But treaty obligation or not, China has already achieved a dramatic slowing in its emissions of carbon dioxide in the last decade, Chinese and Western energy experts say. That record of progress has pushed further into the horizon the day that China will surpass the United States as the lead culprit, and it is something that Mr. Bush seems to have overlooked in his harsh appraisal.

Chinese officials insist that their country will do its fair share to combat a serious global threat.

"We already have one of the world's best records in improving energy efficiency," Zhou Dadi, director of the Energy Research Institute of the central government's State Development Planning Commission, said in an interview.

"Our challenge is this: Can we give people an

acceptable lifestyle and also address the problem of climate change?" Mr. Zhou said.

"As an energy expert, I think we need a demonstration from a developed country to prove that a high living standard can be associated with lower carbon emissions," he said. "Then China will follow that example or even do better."

In the most surprising development, China's annual output of carbon dioxide in the last four years of rapid economic growth has actually declined, according to data compiled by the United States Department of Energy. While the numbers could be overstated because of flaws in both economic and energy statistics, some experts think, China does seem to have achieved a stunning if temporary reversal of the usual trend during economic expansion.

"China's emissions of carbon dioxide have shrunk by 17 percent since the mid-1990's," according to an April report from researchers at the Lawrence Berkeley National Laboratory in California. "Remarkably, over the same period, GDP grew by 36 percent."

"Even without undertaking binding commitments under an international agreement," the researchers concluded, China "has nevertheless contributed substantially to reducing growth in global emissions."

This achievement has been a welcome side effect of China's shift to market prices for fuels, including an end to coal subsidies, and its programs to encourage

energy conservation and fight urban air pollution, mainly by curbing the burning of coal.

Only a few years ago, many studies projected that China would emerge as the world's leading source of carbon dioxide by 2020, but these recent developments appear to have put off that day by years or even decades.

Although the United States has improved its energy efficiency since the oil crises of the 1970's, recent trends like the fad for large, gas-guzzling vehicles have undermined the former goal of returning carbon dioxide output to 1990 levels.

"There is a good basis to argue that China has done more to combat climate change over the past decade than has the United States," according to a new report by the Natural Resources Defense Council, an American environmental group that aids energy conservation projects in China.

Mr. Bush, most recently on Monday, has said he cannot support the 1997 Kyoto Protocol in large part because it exempts China and other developing countries from the initial limits on emissions of greenhouse gases that richer countries are supposed to accept.

With his condemnation of the hard-won treaty, Mr. Bush has set off a tempest in Europe and many developing countries, which are more convinced of the looming threat of climate change and had thought they had agreement to act.

The signatory countries will meet next month in Bonn to search for ways to save an agreement with some teeth.

In his speech on Monday, Mr. Bush complained that China, as the second-largest emitter of greenhouse gases, after the United States, "was entirely exempted from the requirements in the Kyoto Protocol."

Chinese officials point to what they feel is their unacknowledged progress, but they also say the rich countries, which account for most of the carbon dioxide that has already accumulated in the atmosphere, must show that they are serious.

"We've done what we can to reduce emissions, and we'll continue to do so," Gao Feng, a senior Foreign Ministry official here who has taken part in the climate negotiations, said in a recent interview. "But it's not fair to ask the developing countries to take the lead."

"Before the developed countries show that they will do something real and good to address this issue, why should the developing countries make a commitment?" Mr. Gao asked, repeating the arguments that have led to an impasse between developing nations and the Bush administration.

Because it is so large and makes such enormous, inefficient use of coal - the worst fuel in terms of climate effects - China is second only to the United States in emissions of carbon dioxide. At the same time, its people consume on average only one-tenth as much energy as Americans, and they hunger for economic advances.

In the last decade, according to data compiled by the United States Energy Department, China's carbon dioxide emissions from the burning of fossil fuels have climbed at annual rate of 0.9 percent - lower than the 1.3 percent a year registered in the United States, even as China's economy expanded much more rapidly.

Despite the recent slowdown, experts say, substantial future growth in carbon dioxide emissions is inevitable in China as the country develops. Yet officials here also say that China accepts the need to work against global warming and that at some point, they know, China will need to accept international targets.

"Strategically, we have adopted climate change as an important concern in our energy planning," said Mr. Zhou of the Energy Research Institute.

Before 1980, Mr. Zhou said, China's energy use increased 1.6 times as fast as the economy. But in the last 20 years, he said, energy use has grown at less than half the rate of the economy - an exceptional advance in the efficient use of fuels.

India and other large developing countries have also improved efficiency but not as dramatically.

With a combination of increasingly stringent regulations, like energy codes for new buildings, as well as other conservation programs and rising prices, Chinese planners hope to preserve a similar low ratio of energy use to growth in the decade to come, Mr. Zhou said.

"It's not easy because there is no precedent anywhere in the world," he said. Fuel use in much of China remains extremely wasteful, however, leaving opportunities for large gains.

"Our per capita energy use is just one-tenth of that in the United States and one-seventh of that in Europe," Mr. Zhou said. "With development, it must be increased.

"I don't think China can achieve a unique style of development," he said. "Americans drive cars while we ride bicycles; you live in houses while we live in dormitories."

Frank Loy, who as under secretary of state under President Clinton helped negotiate climate issues and has since left government, said he believed that creative new approaches might allow the United States and other countries to proceed against greenhouse gases, but that this would require some give on all sides.

Mr. Loy said it was reasonable for the United States to insist on assurances that its efforts will be part of an effective, shared global plan to curb emissions.

At the same time, he said, it would not be fair to stifle the development of poor countries.

As one possible compromise, Mr. Loy said, developing countries like China could take on an

obligation to keep emissions at a certain fraction of economic growth, rather than setting absolute limits. Or they could adopt targets for energy efficiency as their economies grow.

Mr. Loy said he believed that some in the Bush Administration started out with a clear goal: "to drive a stake through the heart of the Kyoto agreement." But the outcry at home and abroad, he said, has led them to second thoughts.

At the same time, Mr. Loy noted that poor countries, with their extreme vulnerability to climate-related natural disasters, have the most to lose if the agreement collapses, and he called for more flexibility on their part.

The original 1992 treaty laying out the framework for climate talks, he noted, called for "common but differentiated obligations" on the part of rich and poor countries.

"It's too bad that this has been transformed into a group of countries that have real obligations and a group of countries that don't have any," he said.

Have China's Greenhouse Gas Emissions Really Fallen?

*U.S. Embassy—Beijing
Beijing Environment, Science and Technology Update
27 July 2001*

A number of reports have appeared recently in both academic and popular publications maintaining that China's energy consumption, and therefore its emissions of greenhouse gases, has fallen substantially since 1996, even as its economic output has grown by more than a third. An April report from researchers at Lawrence Berkeley National Laboratory, cited in a June New York Times article, estimated China's energy output had fallen 17 percent, and its carbon dioxide emissions 14 percent, since 1996, while GDP grew 36 percent. An April press release issued by the European Commission Delegation in Beijing during the visit of European environment officials asserted that China had increased its energy efficiency 50 percent and reduced its coal use 30 percent over the past five years.

If these statements are true, they would be truly remarkable - outside the realm of experience of any other country in modern times. However, there is

good reason to believe that the reported energy efficiency gains have been greatly exaggerated.

The conclusions of these reports rest almost entirely on Chinese data that show a sharp drop in coal output and consumption after 1996. Chinese official statistics are notoriously unreliable and subject to political manipulation at all levels. For example, it is generally accepted among professional economists outside China that Chinese official GDP growth numbers are inflated - the consensus is by about 2 percentage points on average, although many think the overstatement has been even greater the last two or three years. A Chinese study in the late '80s found that half of the afforestation reported to statistical authorities never took place. One must therefore view Chinese energy statistics with an appropriate degree of skepticism.

There has indeed been a capacity glut in both the coal mining and electric power sectors in recent years as a

result of the economic downturn and industrial restructuring. The Central Government, for a combination of economic, environmental and safety reasons, has ordered tens of thousands of small, inefficient, highly polluting coal mines and power plants to shut down over the past five years. But in many cases localities have pushed back, wanting to preserve local jobs, and environmental restrictions put in place after 1995 may have given rise to an expanding black market in illegal coal. In Shanxi Province, where 25-30 percent of China's coal is produced, roughly half comes from small township and village mines, often tucked away in remote areas beyond the gaze of regulators. Coal distribution in Chinese cities is often still done by pedal cart. Under such circumstances, ordinances can be evaded relatively easily.

The mine in Jiangsu Province where a fatal explosion occurred this week had been ordered shut down a month earlier but had reopened without permission (AFP, July 23). In some provinces, surveys by environmental authorities indicate as many as 30 percent of the enterprises ordered closed for environmental reasons had reopened. Undoubtedly there are many coal mines among them. Other mines have been found to be underreporting their output (Asia Pulse, November 13, 2000).

Many households and businesses in major cities have converted from coal to natural gas in recent years for cooking and heating. But while the official statistics show natural gas use rose 37 percent from 1996 to 1999, this was enough to replace only 9 million tons of coal - less than 1 percent of 1996 consumption. Hydropower increased enough to replace 5 million tons.

At a recent conference of energy experts in Beijing, an official from the International Energy Agency said that IEA was analyzing the Chinese energy data and that its preliminary assessment was that total energy production had fallen by at most 5-8 percent since 1996. At the same meeting, a Chinese expert from a government-affiliated institute announced that new estimates would soon be released revising coal consumption for 1999 upward by 100 million tons, which would make it roughly flat with 1998. If so, more than half of the reported decline in China's energy use will disappear with the stroke of a pencil.

Official data may also significantly understate China's petroleum consumption. China became a net importer of petroleum in 1994. Since then, vehicle traffic in Chinese cities has been doubling roughly every five years. Oil is used in China mostly for

transportation fuel. But the official data show oil consumption rising just 11.4 percent from 1996 to 1999. However, the massive customs fraud scandal uncovered in the Southeastern port of Xiamen last year makes all Chinese import data suspect. The Xiamen ring is reported to have smuggled at least RMB 53 billion (US \$6.4 billion) worth of merchandise between 1996 and 1999, including at least 4.5 million tons (33 million barrels) of refined petroleum products (People's Daily, July 26).

Our guess? China has gotten more efficient, but its greenhouse gas emissions have dropped little, if at all.

* * * * *

Jonathan Sinton, scientist at the Lawrence Berkeley National Laboratory responds to the above article:

"I'm glad to see that our work has had some role in provoking public debate on China's energy statistics and the estimates of GHGs derived from them. Anyone who has works with energy statistics from China (or any country, for that matter) knows that there is inaccuracy and uncertainty in official data. The question, then, is in which direction and by how much should the data be adjusted.

"The sources of inaccuracy pointed out in the article below (Scrutinizing Chinese Energy Statistics) are all important. It is indeed widely accepted that GDP growth been overstated. Small mines have evaded orders to close, and consumers use coal received through unrecorded channels. The magnitude of the correction in coal production, and presumably use, given below corresponds with estimates we have been using for a while in some of our work. Oil products have been smuggled in, and consumption is certainly somewhat higher than officially reported--but any proposed adjustment would be very small compared to the adjustment for coal.

"If it is true that GDP and energy figures need to be adjusted, what are the implications for trends in energy use, greenhouse gas emissions, and energy intensity? Using the adjusted coal figures for 1999, and ignoring for now any adjustments for oil, the drop in coal use from 1996 to 1999 shrinks from 21% to 13%, and the drop in total primary energy use shrinks from 12% to 6%. Looking to 2000, even assuming these adjustments and a somewhat larger rise in energy use than that given by preliminary data, coal use and total primary energy use are still below their 1996 levels. Greenhouse gas emissions basically follow these trends, although growth is slightly

slower due to the gradual shift in fuel structure towards oil. Energy intensity continues to fall, but at rates similar to the US and Taiwan, rather than at rates unique in the world.

“The picture that emerges after these adjustments is, in my opinion, more realistic--and still quite remarkable. It shows a country with an economy that has grown over a period in which its use of fossil fuels has declined significantly. Even after accounting for likely biases in statistics, analysts still have the task of explaining how this happened. Simply asserting that this could not have happened because it is a priori impossible is insufficient. Likewise, concluding that the phenomenon is insignificant because there are uncertainties in the data may cause one to neglect a valuable opportunity to understand how dynamics within a large economy could have led to such an unexpected result. We are faced with an important occurrence that deserves to be explored, not ignored.”

* * * * *

Notes on data presented in the article below:

1. "Since [1994], vehicle traffic in Chinese cities has been doubling roughly every five years."

From 1994 to 1998, the stock of small passenger vehicles doubled, from about 3 to 6 million vehicles. Other indicators did not double, however. From 1994 to 1999, road freight transport rose from 449 to 572 billion ton-km, and road passenger transport from 422 to 620 billion passenger-km, rises of 28% and 47% respectively. Primary oil use rose by about 33% over the same period, according to official data.

2. "Official data show oil consumption rising just 11.4 percent from 1996 to 1999."

Official data show oil use rising by 14% over the period (not 11.4%), about the same rate as road transport of freight, which accounts for the largest portion of oil use.

China Manages to Cut Carbon Dioxide Emissions While its Economy Surges

Edie Weekly Summaries
22 June 2001

Despite claims by the US government that China will soon become the world's largest emitter of greenhouse gases, a new report has found that China has reduced its carbon dioxide emissions by 17% since 1997 while its economy grew 36%.

Less than a week earlier, US President George W. Bush had again rejected participation in the Kyoto Protocol, partly for not being fair by leaving out developing nations, such as China (see related story), but a report released by the US NGO, Natural Resources Defense Council (NRDC), appears to contradict assertions that China is not addressing the global warming problem. Their report confirms research published in May which found that, despite, a booming industry, China has increased energy consumption (see related story).

The NRDC report has found that by switching from coal to cleaner energy sources, initiating energy efficiency programs, and restructuring its economy, China has managed to reduce its CO₂ emissions by 17% since 1997. Over the last decade, while China's CO₂ emissions increased by 8.4%, its economy grew by 142%, compared to US emissions, which

increased by 14%, with economic growth of 31%. According to estimates by the Lawrence Berkeley National Laboratory, even if the Chinese economy continues to grow by 5-6% per year, by 2020, China's carbon dioxide emissions still will be significantly below US emissions levels in 1990.

The study said that China, the world's second biggest producer of greenhouse gases, has aggressively moved to reduce its reliance on burning coal, by phasing out all subsidies to the industry. It has ordered the closure of 25,000 coal mines and has closed inefficient coal-fired electric plants, resulting in coal consumption declining by 411 million tonnes since 1996, according to US Department of Energy statistics. Over the same period, US coal consumption increased by 40 tonnes, and may be set for a further boost with the advent of Bush's recent energy policy (see related story).

At the beginning of the year China announced that it was to spend more than 1% of its GDP on improving the state of national air and water, and that by 2005, 'clean energy' would account for 75% of energy consumed in the Chinese capital.

"Contrary to the president's claims, China has cut its carbon dioxide emissions 17% while its economy has been booming," said Robert Watson, an NRDC senior scientist and co-author of the report. "In fact, the evidence shows that China has done more than the United States to combat global warming over the last decade. The president should stop hiding behind China's skirts as an excuse for stalling on taking

action on global warming. President Bush says he is serious about addressing global warming, but his own energy plan would increase our reliance on coal, while his proposed budget would cut the heart out of federal energy efficiency programmes."



Testing The Waters: Nanjing to be Pilot City for National Environmental Protection Plan

China Online News
21 June 2001

Nanjing's municipal government will be investing 4.92 billion yuan (US \$595.14 million) in 28 environmental protection projects by 2003.

Authorities from Nanjing's municipal government devised the environmental protection plan. It was announced that the plan passed an inspection conducted by state-level experts on the environment, reported the June 19 Xinhuashe (Xinhua News Agency).

Nanjing is to carry out 10 major environment protection construction projects, including a sewage treatment capacity-expansion project in Jiangxinzhou in three years. After the construction's completion, Jiangxinzhou's daily sewage-treatment capacity is expected to increase from the current 260,000 tons to 640,000 tons.

Other projects include the supplementation of 280,000 tons of fresh water to Xuanwu Lake and the Interior Qinhuai River and the providing of natural gas pipelines to one-fourth the city's families. Also, motorcycles with two-stroke gas engines will be banned from the city proper, and 1,000 buses will be refurbished into liquefied petroleum gas-powered vehicles.

In addition, the municipal government will also carry out five environmental protection management projects, which include the proposed unified supervision and management system on water-quality protection for the Nanjing section of the Yangtze River.

Furthermore, plans are expected for constructing a pilot environmental-protection residential area in the city, the article said.

New Studies Highlight Opportunities for China, Brazil and Argentina to Reduce Emissions While Maintaining Economic Growth

PR Newswire
23 May 2001

WASHINGTON- The Pew Center on Global Climate Change released today three new studies that outline realistic opportunities for China, Brazil and Argentina to address the challenge of climate change. The reports are part of a six report series that examines ways to reduce emissions in developing countries without compromising economic growth.

China, Brazil and Argentina are becoming leaders among developing nations in the international climate

change debate and the case studies demonstrate the effectiveness of different policy approaches to emission reductions. In the latest reports, the authors use a linear programming model to conduct an assessment of the technological options available to each country for supplying new electric power generation through 2015.

"These reports are particularly noteworthy because of the geographical and economic importance of each

nation examined. They highlight the different challenges and circumstances that developing nations face in addressing environmental problems," said Eileen Claussen, President of the Pew Center on Global Climate Change.

The three previous reports released in the series included an overview piece entitled *Developing Countries and Global Climate Change: Electric Power Options for Growth* and an examination of the electric power sectors of India and Korea.

Following is a brief overview of each report's findings, recommendations and conclusions:

China

The Developing Countries and Global Climate Change: Electric Power Options in China report was completed by the Beijing Energy Efficiency Center and the Battelle Advanced International Studies Unit. With annual releases of over 918 million metric tons of carbon dioxide into the atmosphere, Chinese decisions affecting energy development and emissions mitigation will significantly impact world climate. The report assesses the current and future state of the power sector to meet projected demand through 2015 under several scenarios.

The Chinese analysis yielded several insights: "Due to the heavy reliance on coal-fired power generation, baseline carbon dioxide and sulfur dioxide emissions from thermal plants will more than double by 2015." Increasing demand-side energy efficiency by 10 percent could reduce carbon dioxide and sulfur dioxide emissions by 19 and 13 percent, respectively, in 2015, while lowering costs. "Expanding the availability of low-cost natural gas through market reforms could reduce emissions of carbon dioxide and sulfur dioxide in the power sector by 14 and 35 percent, respectively, by 2015, and increase costs by only 4 percent compared to the baseline." Accelerating the penetration of cleaner coal technologies could help China reduce sulfur dioxide and particulate emissions, but the associated impact on carbon emissions would be minimal and the cost would increase by 6 percent.

Brazil

Developing Countries and Global Climate Change: Electric Power Options in Brazil, was developed by the Federal University of Rio de Janeiro, Energy

Planning Program, Center for Technology, and the Battelle Advanced International Studies Unit. The study points out that Brazil produces relatively few greenhouse gas emissions relative to its size and population. This is mainly due to the dominant role of hydropower in electricity generation. Yet its greenhouse gas emissions could be expected to quadruple, as it changes its fuel mix over the next 20 years.

The Brazilian case study also revealed that: "Many new investors may favor natural gas-fired combined-cycle plants that would increase carbon dioxide emissions from 3.4 million tons in 1995 to 14.5 million tons in 2015." Further tightening of local environmental regulations and adoption of renewable energy policies could reduce carbon dioxide and sulfur dioxide emissions by 82 percent and 75 percent, respectively, by 2015. Creating a carbon-free power sector would require an additional \$25 billion in cumulative costs by 2015.

Argentina

The last report in the series is entitled *Developing Countries and Global Climate Change: Electric Power Options in Argentina* and was developed by the Bariloche Foundation also working with Battelle. The report finds that the market reforms the country has been implementing since the early 1990's provided mixed, but on balance, positive environmental results. The country's electric power demand is expected to more than triple over the next 15 years, yet its emissions of greenhouse gases, do not have to increase at the same rate. It finds that investments in natural gas combined-cycle plants and renewable energy sources could provide a prudent path for energy development and environmental protection.

The report also found several key opportunities, including: "Adopting policies that favor renewable energy sources and nuclear power would cost \$32 billion by 2015 and would decrease carbon dioxide emissions from 14 million tons in the baseline to 11 million tons in 2015." Increasing energy efficiency would reduce total costs by \$6.3 billion and carbon dioxide, sulfur dioxide and nitrogen oxide emissions would all decline 20 percent compared to the baseline.

A complete copy of each report is available on the Pew Center's web site, <http://www.pewclimate.org>.



Still Spewing, Just a Little Less

Times are changing. Industry in China is beginning to realize that if it wants to get ahead it must go green. Now that the environment is in vogue, clean, efficient business practices are good for both the image and the bottom line

Far Eastern Economic Review
5 July 2001
Kathy Wilhelm

More production, more pollution. That has been the norm for Chinese industry during the no-holds-barred growth of the past two decades, as the nation's grey skies and black rivers attest. But the power of the market is finally coming to the aid of the environment. Leading Chinese companies with global business interests are cleaning up their acts to bolster their bottom lines.

Take Sinopec, China's top oil refiner. It bought full-page newspaper ads in April to announce its adoption of a health, safety and environment or HSE management system partly modelled on that of BP Amoco. It promised to spend 1.2 billion renminbi (\$146 million) this year to upgrade safety and make production more environmentally friendly.

An attack of altruism? No, good business. "It's an industry demand," says Zhai Qi, head of Sinopec's Safety and Environment Bureau. "Companies that don't implement HSE management systems will have limited options when it comes to international cooperation." Having an HSE system, he says, "is good for our corporate image and creates a good foundation for entering world markets."

Most Chinese industry is inefficient and heavily polluting. Many factories don't treat their waste at all before discharging it into the air or water, confident that local officials who often double as investors will protect them. Only the nation's leading cities have mustered the political will to force clean-ups or factory closures at the expense of tax revenues and employment.

"It's like a sports event where the athlete and the referee are one and the same person," says Niu Wenyuan, head of the Sustainable Development Strategy Group at the Chinese Academy of Sciences, who travels the country advising governments and companies on the long-term costs of unchecked pollution. "If you're the mayor of a city, you're also in charge of the city's environmental-protection bureau and you won't let it shut down a polluting factory."

Chinese companies serving only the domestic market

may enjoy their licence to pollute for years. But those with global aspirations are encountering a different mix of incentives, says Husayn Anwar, chief executive of Sinosphere, an environmental consultancy in Beijing.

"All those companies that are adopting environmental programmes are doing it because they have something to lose--reputation, money, market share," he says. "Those that go abroad have suddenly realized: 'People can scrutinize us, can take us to court'."

Zhai says Sinopec has noted the beating that oil companies' share prices regularly take on world markets following any accident. "Western green groups will always demand more, and companies that fail to be proactive may find their existence threatened," he says. "It's a wake-up call for us."

Sinopec began drafting its HSE system in 1999, about the same time it started preparing for its October 2000 listing on the Hong Kong and New York stock exchanges. It wanted to reduce the chances of accidents that could endanger workers and the environment. Instead of just mounting a safety campaign, Sinopec drew up detailed work codes for each operating unit and made safety a factor in awarding bonuses.

With its 520,000 employees scattered across oil rigs, refineries, petrochemical plants and fuel stations, Sinopec created a database containing details of each facility's emissions, accident history and other related information.

By the time Sinopec announced the system to the public in April, it was already implementing it in more than 20% of its units, says Zhai. The goal is to reach 80% by the year's end.

Meanwhile, harmful emissions were falling through the 1990s, even before the HSE system was introduced. The level of contaminants in discharged water was cut 7% in 2000 from the year before, says

Zhai. Sulphur dioxide emissions were reduced 40% by cutting down on the amount of natural gas burned off at oil wells and refineries.

Anwar says Sinopec's HSE system is impressive. "In terms of policy, Sinopec has pretty much caught up" with international standards, he says. "The problem is implementation. There they are probably still half a decade behind." Most impressive is the degree to which the company has linked its public image to environmental performance, he adds. "No other company in China has gone so far."

More To Follow

A few others are starting down the same road, however. Shanghai authorities have long showcased Baoshan Iron and Steel, built in the 1980s using the latest equipment from Japan. That auspicious start made it easily the cleanest steel mill in the country, but now authorities want it to be on a par with the best international steel plants.

"We satisfy the present government requirements but Shanghai wants to be one of the great cities of the world. Its environmental demands will definitely get tougher, so we have to stay ahead of the curve," says Guo Kezhong, assistant to Baoshan's president.

The safety and environment chief of Baoshan Steel, Sun Xiaolin, ticks off recent achievements: Sulphur dioxide emissions last year down 80% from 1990 levels. Smoke and ash emissions 50% lower than in 1998. Virtually all the waste water was treated on-site and reused in production, while most furnace waste was processed and sold for use in road construction. Big gains were made in energy efficiency, with the amount of fuel needed to produce a tonne of steel

down to 713 kilograms from 767 kilograms in 1996.

"We're still behind the world leaders in Europe, Japan and South Korea when it comes to some pollutants, like dust," says Guo. "But our energy efficiency is ahead of everyone except the Japanese."

The improved energy efficiency helps the bottom line, as does some recycling. But Guo says anti-pollution upgrades rarely pay for themselves. "It's not a question of making money," he says. "It's a question of long-term, sustainable development." With Baoshan's public image tied to rising international standards, he says the company can't afford to stop investing in clean production. "We are China's model steel mill. We have to maintain our reputation."

If these companies' green strategies help them thrive, other companies may follow suit. Niu, of the Chinese Academy of Sciences, estimates that fewer than 5% of Chinese companies do any long-term environmental planning. "What they understand is that if they pollute, they can be fined," he says. "They haven't calculated the real costs of the resources they use or considered what they'll do in 10 years if they've depleted the resources."

Zhai agrees: "Few companies have a sense of urgency." Sinopec was awakened by the clamour of international green groups. But passing the message on to the rest of Chinese industry could be a long process.



China: Companies Unite In Green Aspirations Government Suspicion Stymies Real Progress

Far Eastern Economic Review
5 July 2001
Kathy Wilhelm

Some of the pressure on Chinese companies to improve their environmental records comes from none other than their foreign business partners. Large multinationals know that grass-roots groups in their home countries will attack them if their Chinese partners are socially irresponsible.

BP Amoco got a taste of this last year when it took a strategic stake in PetroChina, China's No. 1 oil producer, whose parent company has controversial investments in Sudan. After also taking a stake in Sinopec, China's No. 2 oil producer, BP helped the Chinese company to overhaul its environmental-

management system. "The better Sinopec looks, the healthier foreign companies' relationships with Sinopec can be," says Husayn Anwar, a Beijing-based environmental consultant.

That's why leading multinationals that do business in China have been trying to create a business council for sustainable development there: They want a forum in which they can share environmental best practices while exerting a bit of peer pressure.

Such business councils began forming around the world in the early 1990s in response to the 1992 UN conference on the environment in Rio de Janeiro. At the centre is the Geneva-based World Business Council for Sustainable Development with 150 multinational members, while about 800 smaller companies belong to 30 national councils. All the councils try to stake a role for businesses in setting environmental policy, while holding their members to agreed standards for being good corporate citizens.

In China, however, official suspicion of non-government organizations has got in the way of starting a local council. Multinationals first raised the idea in 1995; last year, the China Enterprise Confederation, a semi-official group, joined the lobbying effort and agreed to act as a secretariat. No one knows when or if approval may come from the

Ministry of Civil Affairs and the State Economic and Trade Commission.

"We think it's worthwhile to keep trying," says the confederation's Chen Hong. She says a council could play a valuable educational role in China, where few factory managers know much about treating emissions or recycling waste. "The big companies that are already going global can take the lead," she says.

Some big Chinese companies are enthusiastic. Sinopec, the only one on the world council, has volunteered to be founding president. "The best part is that many measures for helping the environment also improve efficiency," says Guo Kezhong, assistant to the president of Baoshan Iron and Steel.

Anwar says that's the reason the business-council movement has flourished elsewhere. "The approach is not end-of-pipe clean-up," he says. "Companies go through their entire processes and look for efficiencies. They use less energy, or harness resources that previously were lost. Some companies discover they are actually becoming more profitable." If so, then Chinese companies may find themselves at a competitive disadvantage the longer their entry into the movement is delayed.



Nation-Wide Examination of Industrial Enterprises

*ERM China/EHS Review
June 2001*

SEPA's recent investigation of key pollution areas and key river basins found high industrial pollution and ecological destruction occurs where enterprises work for only short-term profit. At present, approximately 10% China's enterprises, which previously had met the state emission requirements, now discharge beyond the emission standard. In addition, 30% of the industrial polluters that had been closed are operating again without permission.

SEPA and its local EPBs will work with the State Economic and Trade Commission and State Forestry Administration to conduct a nation-wide investigation in June and July. This time the investigation will focus on enterprises violating environmental regulations, ecologically destructive accidents, and violators causing serious environmental pollution and ecological destruction.

The investigation will consider first the type of industrial pollution, especially where it is discharged without approval, as well as stopping the operation of unauthorised pollution causing equipment in seriously polluting industries (such as papermaking, brewery and chemical industries). Secondly, those enterprises have been required to stop operation but have restarted and persist in polluting without authorisation. Thirdly, newly built projects which cause serious pollution. Fourthly water pollution especially in the fields of Huaihe River, Haihe River, Liaohe River, Taihu Lake, Dianchi Lake, Chaohu Lake and the Three Gorges. And finally, pollution caused by hazardous chemicals.

In seriously polluted areas, environmental departments will be required to: strictly control newly built projects; immediately shut down enterprises that

did not reach treatment targets before the end of last year and still operate (except those regulated by the State); strict examination, in accordance with regulations, those industrial enterprises that reached discharge standards at the end of last year but were

not examined; shut down enterprises that have already passed examination but discharge over the standard; and punish enterprises who stopped using pollution control equipment without authorization.



Beijing: The Capital Spent Over US \$1.4 Billion on Environmental Protection in 2000

*ERM China/EHS Review
June 2001*

According to the Report on the State of the Environment in Beijing issued on June 4th by the Beijing Environmental Protection Bureau (BJEPB). Beijing spent more 11.63 billion yuan (US \$1.4 billion) in efforts to protect the environment in 2000. The figure accounts for 4.7% of Beijing's gross domestic product for 2000, and is a 15% increase from 1999.

Beijing set aside 1.28 billion yuan (US \$154.89 million) to relocate polluting companies. Twenty five companies that had previously failed to meet the city's environmental protection standards were forced

to shut down to fix their problems. Subsequently 13 of them successfully passed the BJEPB re-inspection at the end of 2000. The remaining 12 are either still closed or have gone bankrupt. Regarding air quality, Beijing also reported significant improvements and the acid rain frequency rate dropped to zero. Noise level also improved in 2000, reaching only 53.9 decibels on average, or 0.3 decibels lower than 1999. But Beijing's treatment of polluted urban water remained low, reaching only 40.6%. The rate of controlled disposal of garbage reached 81.5% as the city disposed of a total of 2.96 million tons of garbage in 2000.



Beijing: More Polluters To Be Removed

*ERM China/EHS Review
June 2001*

For the 10th Five-year Plan (2001-05) Beijing will move hundreds of industrial enterprises out of the 4th Ring Road to solve pollution and urban noise problems, according to the vice-mayor of Beijing, speaking on June 11.

Beijing's 56.8% of industrial enterprises huddled in the city center takes up only 1.9% of the whole city. This causes a series of problems such as dense population, traffic congestion, energy shortage and environmental pollution.

Over the past year, about 1 million square meters has been cleared as a result of a series of relocations and

another 6 million are anticipated over the next five years. It is expected to make the city's total clear out since 1985 top 8 million square meters.

As planned, an orderly industrial layout will be in place by 2005. The areas inside the fourth Ring road will focus on non-polluting industries, such as marketing, and research as well as be a window for foreign exchange. The belts along the fourth Ring road will be home to new and high-tech zones specializing in software, R&D, medicine and energies. Meanwhile, suburbs will become zones focusing on modern processing, manufacturing and raw material supply.



Government Orders Recall Of Bad-For-Environment Cars

China Online
3 July 2001

A government notice was posted on June 27 requiring the immediate cease in production of 187 models of sedans and five models of buses using carburetors. Due to the air pollution and high fuel consumption, the sedans using carburetors are being completely replaced by those with electronic injectors.

Four offices of the Chinese government including the State Environmental Protection Administration and the State Economic and Trade Commission issued the notice, reported Sina.com on June 28.

The 187 car models involve more than 50 trademarks and brands of 41 manufacturers. According to the requirements of the notice, the production of these models must be discontinued immediately. Starting

September 1, the sales of these models will be forbidden. Furthermore, the departments of public security and traffic control will not accept the registration of these models, the story said.

Sellers must accept, unconditionally, any returned automobiles, which have already been sold. The manufacturers are responsible for recalling the cars.

The State Council has decided that sedans manufactured in 2001 or later must use electronic injectors and exhaust purifying devices. By the end of last year, there were still nearly 100,000 sedans in China without the above-mentioned two devices installed, accounting for 15 percent of the total annual output of sedans, the story said.



China Unifies Auto-Emission Standards

ERM China/EHS Review
May 2001

In an effort to end confusion in the creation and dissemination of pollutant-discharge standards in China, SEPA and the State Bureau of Quality and Technical Supervision (SBQTS) issued three standards for automobile emissions on April 19th, 2001, replacing the original 11 standards - most of which were redundant.

The three standards are:

-Limits and Measuring Methods of Light-Duty Automobile Emissions (I) – GB18352.1-2001

-Limits and Measuring Methods of Light-Duty Automobile Emissions (II) – GB18352.2-2001

-Limits and Measuring Methods of Car-born Compression Ignition Engine Emissions – GB17691-2001.

The new standards require light-duty vehicles in China to meet the second European Emission Standard by the year 2004. By the year 2010, all motor vehicles in China should have met international emission standards.

Thinking About Renewable Energy

U.S. Embassy - Beijing

*Beijing Environment, Science and Technology Update
13 April 2001*

The April 11 Beijing Youth Daily features a special report on renewable energy in China, including interviews of State Development Planning Commission (SDPC) officials. SDPC Energy Research Institute Director Zhou Dadi reports that China's total energy demand will be roughly equivalent to present U.S. demand by 2020. Increasing reliance on imported energy, Zhou observes, increases the importance of developing new renewable energy resources within China. (According to forecasts, China's dependence on imported oil may reach 40% by 2010.) SDPC Renewable Energy Development Center Director Li Jingjing, says that China needs to follow the lead of the European Union, which aims to increase its reliance on renewable sources from the current 6% to 12% by 2010. China's current proportion of clean

renewable energy is only 1.8%, although this rises to 16.4% if the burning of straw is counted as a renewable energy source. Li points to the unfairness of wealthier eastern China using less-expensive non-renewable energy sources, while in poorer western China 15% of energy comes from clean renewable sources.

Meanwhile, on the energy efficiency front, Beijing Energy Efficiency Center Director Dai Yande adds that China now uses 913 tons of standard oil equivalent for each \$1 million of GDP produced. Although the accuracy of such comparisons depends on the exchange rate used, Japan at current exchange rates uses only 96 tons per \$1 million in GDP, while the global average is 274 tons -- leaving China with considerable room for improvement.

Shell Sets Up Solar in China

SolarAccess.com

17 July 2001

London, England-More than 75,000 homes in China will be equipped with solar electric systems over the next five years.

Shell Renewables has signed an agreement with the Sun Oasis Company in Beijing to supply PV systems in the Xinjiang Autonomous Region of western China. The project is supported by a grant of US \$15 million from the Dutch government and is part of the Chinese 'Brightness Program' to bring electricity to remote communities.

"This project demonstrates yet again that solar power is starting to provide a solution for some of the two billion people in remote areas who have little chance of ever getting grid power," says Philippe De Renzy-Martin, chief operating officer Shell Solar. "It is a big potential market that with the right product packages, and support where necessary, is going to account for an increasing part of our solar business."

Shell Renewables wants to become a major player in the solar market around the world and has established a joint venture with Siemens Solar. The company

predicts that 10 percent of its solar sales will be in rural markets.

Last month, Shell said it would spend up to \$1 billion on renewable energy programs over the next five years. The group's existing five-year \$500 million spending plan for renewables is due to end in late 2002.

The Xinjiang project is Shell's first renewable energy project in China, and builds on its rural electrification activities in South Africa, the Philippines, Sri Lanka and India.

Sun Oasis will market, install and maintain the PV home systems, which will be supplied by Shell. The oil company will also provide technical and management assistance.

More than 10,000 homes in Xinjiang have been equipped with solar systems in the past decade. China obtains three-quarters of its electricity from coal.



Lanzhou: Foreign Loan Aids Wind Power Station

*ERM China/EHS Review
June 2001*

Lanzhou, Gansu Province in Northwest China is to build a wind generated power station with the aid of Spanish Government loans, in a bid to tap its rich wind power resources. The Yumen Wind Power Station will have an installed capacity of 7,200 kilowatts and is designed to generate 18.66 million kilowatt hours of electricity a year. Total cost is

estimated at 71.77 million RMB (US \$8.6 million), which includes a US \$4.8 million Spanish Government loan. Key equipment in the power station will be imported from Spain. According to local officials, Gansu Province plans to build at least three wind power stations in the next five years, with a combined installed capacity of 100,000 kilowatts.



Beijing Makes Olympian Effort to Control its Pollution

China Online News

13 July 2001

Lester J. Gesteland

Beijing's victory in hosting the 2008 Olympic Games is drawing cheers from Chinese and friends of China around the world. Wang Wei, secretary general of the Beijing bid, and his team will no doubt be feted as heroes upon their return to the capital city.

Not everyone is applauding, however.

Besides critics of China's human rights record, there are many who are wondering whether Beijing is the right place to host such an event. Their main concern: air pollution.

Anyone who has visited or lived in Beijing, especially during the winter, knows that this concern is well placed—the sky can get so choked with dust and smoke that at times it can be difficult to see even the sun. At least that was the case a few years ago.

In November 1997 the World Bank published a report naming Beijing as the most polluted city in China. China's own Environmental Bureau admitted that at times, particularly during the winter months when coal burning is at its height, the air pollution became so bad it surpassed that of even Mexico City, the most polluted city in the world.

However, things have been changing. The first major change was that the Chinese government admitted there was a problem, and did so in both the local and world press. Then the city government began instituting measures, along with enforcing measures already on the books, to clean up the air. The result was that from 1998 to 2000 pollution levels fell enough that foreign visitors began to take notice.

"I am already amazed about how air quality has improved so far. At least during the week of my stay, the air quality was as good, if not better, as cities like Osaka," an American said after visiting Beijing in August 2000. "The changes in Beijing reminds me of how Tokyo reformed itself into a modern city for the 1964 Olympics."

Building up for the Olympics

And that is exactly what Beijing is trying to do. City officials are making every effort to turn the nation's capital into a world-class metropolis.

In September 2000, the government announced it planned to complete 50 major construction projects to strengthen its bid, at a cost of 147.8 billion yuan (US \$17.9 billion). These include four subway and light-rail projects and nine road reconstruction projects. It also planned to replace coal-powered boilers in the city with those using cleaner fuels.

"After this project is finished, the city's annual discharge of smoke and dust is expected to be cut by 7,200 tons, carbon dioxide by more than 2,000 tons and carbon monoxide by more than 3,000 tons," a local Chinese newspaper reported.

In October, the municipal government passed measures to tackle auto emissions in the city—restricting drivers to use Beijing's major highway, Fourth Ring Road, only on odd or even number dates. The city's environmental agency also announced it would be randomly checking emissions from enterprises based in Beijing, including those that had passed previous checks.

Twenty new measures went into effect on November 1st to cut down on smog. Among them was a regulation giving the Beijing Municipal Environmental Protection Bureau the authority to order heavy polluters to stop production during particularly hazy days. Traffic police were also directed to apprehend vehicles "emitting black or blue smoke" and fine the owners.

January 2001 saw the release of "Measures on Implementing 'The Law on Air Pollution Prevention and Control of the People's Republic of China'" by the Beijing Municipal Environmental Protection Bureau. Under this law, no restaurant producing smoke pollution is allowed to conduct business on the first floor of residential buildings in Beijing.

The law also tightened restrictions on cars with unacceptable levels of emissions.

"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," reported another Chinese newspaper.

If a pollution-discharging enterprise refuses a city directive to shut down or partly shut down its operations, under the new law the city government can cut off the enterprise's power and water supplies. The municipal environmental protection authority may also levy a fine to the tune of 10,000 yuan to 100,000 yuan (US \$1,207.73 to US \$12,077.30).

The city government made more announcements the following month. After a successful effort to relocate five noisy, polluting factories out of the Guangqumenwai area in 2001, the Beijing municipality will relocate 20 more plants this year and transfer 1 million square meters (10.76 million square feet) of industrial land in the city center to other uses, the authorities said.

The government also checked off a list of measures it had already taken to improve the capital's air quality:

- * Extending the use of clean fuels, such as natural gas and electricity, and recommending the use of low-sulfa high-quality coal over dirty, low-quality coal;

- * Establishing local emissions standards for motor vehicles that are stricter than the national standard; 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;

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

- * Renovating the central water system in Beijing's urban area and strengthening protections on water resources.

In short, much has been done, and city leaders expect to do much more to clean up the capital's air by 2008.

"Beijing will have air quality as good as Paris," Xie Zhenhua of the State Environmental Protection Administration said at a press briefing in December last year.

Beijing to Spend Billions to Beat Pollution for Olympics

*Agence France Presse
10 July 2001
Peter Harmsen*

BEIJING (AFP) - Beijing is promising to shake off an unwanted tag as one of the most polluted capitals in the world and transform the city into a green haven before the 2008 Olympic Games.

The plan will cost more than 12 billion dollars, and as a result 40 percent of this city of 13 million people will be turned into green space, city planners promise.

"The world is seeing an exciting new Beijing," the city's vice mayor Liu Jingmin said in a statement distributed by the Olympic bid committee.

"Our initiatives in environmental protection ... will improve the living standards of all our people, promote sustainable development, and of course, provide for a great Olympics," he said.

Beijing's bid promoters are keenly aware the environmental issue will be a key factor when the International Olympic Committee picks the host city for the 2008 Games in Moscow on Friday.

At the Olympic bid committee's offices in downtown Beijing, a scale model of what part of the capital will look like in 2008 shows the essence of this vision: a park landscape in deep green, criss-crossed by rivers and canals and just a few roads.

"The sky is largely blue, and the city so green as to be reminiscent of a tropical isle," the brochure from the bid committee explains proudly.

The Chinese government has clearly decided to mobilize huge resources in order to turn this ambitious goal into reality.

Millions of trees will be planted within the city limits in order to ensure that green belts will account for 12,000 hectares of the urban area, with the effort crowned by a 760-hectare man-made forest near the Olympic Village itself.

The quality of the air -- striking many first-time visitors to Beijing as among the city's least pleasant surprises -- will be another main focus for city planners.

Beijing, a largely coal-operated city for several decades, is trying to change its fuel supply towards natural gas, or even solar and geo-thermal energy.

Local officials have already taken a small step in this direction with a solar-driven telephone booth near one of the Olympic venues -- with the small flaw that it does not appear to work properly.

Detailed plans call for 90 percent of buses and 70 percent of taxis to be fuelled by clean energy in 2007, while at the same time 292 liquefied petroleum gas stations are expected to dot the city-scape.

By the second half of this decade a large part of Beijing's traffic is expected to go underground, as officials hope to double the volume of subway traffic from the current 1.3 million daily passengers.

Global Village of Beijing, an environmental group which is not directly controlled by the state but has

been recruited as a consultant for the green efforts, applauds these efforts.

"It will lead to more money being spent by the government and will also help in the environmental education of ordinary people," said Song Qinghua, a spokeswoman for the group.

"We can't just rely on the government to do everything for us, because environmental protection begins with ourselves," she said.

The effort to turn Beijing into a cleaner place took off in 1998, and since then 30 billion yuan (3.6 billion dollars) has been poured into the effort, according to city planners.

In the years until the Olympics, the city intends to invest another 70 billion yuan (8.6 billion dollars) in the efforts.

Following the practice of the past few years, the money will come partly from the city and central governments, and partly from international institutions such as the Asian Development Bank and the World Bank, they said.

"For the period until 2007, the exact amount will be decided by the government later," said Yu Xiaoxuan, director of the bid committee's environmental department. "Maybe, if 70 billion yuan isn't enough, we may have to add more."

Greening Beijing for the Games

China Environment News
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China's Environment Minister Xie Zhenhua says Beijing's successful bid to host the 2008 Olympics provides both challenges and opportunities for the city's environment. Addressing an experts meeting on Beijing's air pollution control plan July 23, Xie said Vice Premier Li Lanqing had promised to show the world in 2008 a capital city with "blue skies, clear water and green landscapes." Xie said Beijing still had significant shortcomings in that regard. The demands placed on Beijing's environmental protection authorities over the next seven years would therefore become greater, their work would

become more urgent, and standards would have to be made stricter.

At the same meeting, Beijing Municipal officials reported that spending on environmental protection in the city last year exceeded RMB 10 billion (US \$1.2 billion), or 4.7 percent of GDP. They said the average daily concentration of total suspended particulates in 2000 was down 7 percent compared with 1998; respirable particulates (PM10) were down 19 percent; sulfur dioxide 41 percent; nitrogen oxides 12 percent; and carbon monoxide 18 percent.