The China Sustainable Energy Program
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CHINA CLIPPINGS

Issue 17 April 2005

Message from the Director:

Dear Energy Policy Colleagues:

Attached is the latest quarterly update of the China Sustainable Energy Program.

Under pressure to meet the nation's surging demand for power, the National People's Congress (NPC) adopted a Renewable Energy Law earlier than expected this year. The law, which will come into effect January 1, 2005, includes tax incentives and subsidies for renewable energy projects and a national fund for research and development. The NPC has tasked the National Development and Reform Commission (NDRC) to develop detailed implementing regulations for the law. Grantees will be working closely with NDRC over the coming months to incorporate a target mandating that 10 percent of national electricity come from renewables by 2020.

China's thirst for oil and cars continues to make world headlines. China's government realizes that the rising demand for cars is worsening urban air pollution, and is responding by increasing research into advanced technology vehicles and alternative fuels. The State Environmental Protection Administration promulgated new national tailpipe emissions standards in April, including criteria pollutant limits for light- and heavy-duty vehicles.

Best regards,
Doug Ogden

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The David and Lucile Packard Foundation, The William and Flora Hewlett Foundation,
in partnership with The Energy Foundation

旧金山总部 San Francisco Office:
1012 Torney Avenue #1 • San Francisco, CA 94129, U.S.A.
电话Tel: (415) 561-6700 • 传真Fax: (415) 561-6709 • 电子邮件Email: china@ef.org • 网站Web: www.efchina.org

北京办事处 Beijing Office:
中国北京市建国们外大街 19 号 国际大厦2403 室 • 邮编: 100004
CITIC Building, Room 2403, No. 19, Jianguomenwai Dajie • Beijing 100004, P.R. China
电话Tel: (86-10) 8526-2422 • 传真Fax: (86-10) 6525-3764 • 电子邮件Email: china@ef.org • 网站Web: www.efchina.org

Program Updates April 2005

Renewable Energy

China's National People's Congress (NPC) adopted a Renewable Energy Law on February 28th, 2005. The law requires all utilities to purchase 100% of the output of approved renewable energy facilities, including small hydro (under 25-MW), wind, solar, geothermal, and biomass. The law establishes a national fund to foster renewable energy development, and discounted lending and tax preferences for renewable energy projects. The grid's buying price for renewables will be set by the National Development and Reform Commission (NDRC), and marginal costs will be spread across all customers on the grid. The NPC also delegated authority to NDRC to develop implementing regulations; NDRC previously developed a renewable energy plan that includes a national electricity target of 10% renewables by 2020 (up from 3% today). Grantees will be working over the coming months to incorporate the target into the law's implementing regulations.

NDRC approved the third batch of wind concession projects totaling 450 megawatts, a $400 million investment in new wind energy technologies.

The Center for Resource Solutions is to be commended for these extraordinary renewable energy policy developments.

Electric Utilities

NDRC adopted electricity pricing reforms at the end of March that better align electricity prices with social costs, including in three areas: (1) interconnection fees, (2) transmission and distribution tariffs, and (3) retail tariffs. NDRC now has discretion to charge higher interconnection fees for older, dirty coal plants.

Low-Carbon Development Paths

Vice Premier Zeng Peiyan called on the Ministry of Finance (MOF) and NDRC to expedite tax and fiscal policy reforms to promote energy efficiency and renewable energy; tax and fiscal policy reforms targeting MOF activity are a principal emphasis of CSEP programs in 2005. Grantee the State Council Development Research Center is coordinating an inter-ministerial policy reform project calling for institutional and capacity enhancement reforms, energy pricing reforms, and tax, fiscal, and investment policies to promote energy efficiency and renewable energy development.

CSEP successfully recruited three new Senior Policy Advisory Council (PAC) members, including the Vice Minister of MOF, Vice Minister of the Ministry of Construction (MOC), and the Vice Administrator of the State Environmental Protection Administration (SEPA). We also added seven new directors-general for the Dialogue Partners group, including from NDRC, MOF, SEPA, and MOC.

Buildings

MOC issued China's first national commercial building code in early April, aimed at incorporating best practice energy efficiency into China's burgeoning skyrise buildings. The code is expected to cut 50 million tons of carbon in 2020.

Industry

In a meeting with the National People's Congress, Premier Wen Jiabao called for expedited efficiency in large industrial enterprises, including national adoption of energy savings targets piloted by CSEP grantees in Shandong Province. There is speculation that China may reinvigorate the industrial energy auditing efforts of the 1980s to counter the rampant waste of coal-fired and oil-based industrial energy.

Transportation

SEPA promulgated new national tailpipe emissions standards on April 27th, including new criteria pollutant limits for light- and heavy-duty vehicles, and noise limits for motorcycles and mopeds.

Beijing launched the design phase of two more bus rapid transit (BRT) corridors (modeled on the first corridor, half of which is now operating). The City of Jinan similarly launched the design phase of a new BRT corridor.

The Beijing municipal government issued the official registration of the Hewlett Foundation-supported China Sustainable Transportation Center (CSTC), which provides technical advice and support to all Chinese cities developing BRT systems.

The National People's Congress (NPC) will examine a draft law to encourage the use of renewable energy. SOHU.COM

Workshop Updates April 2005

Fiscal Policies for Promoting Advanced Vehicle Technologies

China is poised to develop tax and fiscal policies to penalize older, dirtier technologies generally and provide incentives for newer, cleaner technologies. Rising oil imports have been a principal concern driving the interest in tax and fiscal policy reforms. The China Automotive Technology and Research Center (CATARC) with assistance from The Energy Foundation and The William and Flora Hewlett Foundation held an International Conference on Tax and Fiscal Policies for Promoting Cleaner and More Efficient Vehicle Technologies on March 21-22, 2005 in Beijing. The conference introduced tax and fiscal policies used in the U.S., Canada, Japan, and the European Union to promote clean and efficient vehicle technologies, and brought together over 100 Chinese and international experts, as well as officials from the Ministry of Finance, the National Development and Reform Commission (NDRC), and State Environmental Protection Administration.

Renewable Energy Law and Implementation Rules

On April 5, 2005, the National People's Congress' (NPC) Legal Affairs Committee, Environment and Resources Committee, and Legislative Affairs Committee, as well as the National Development Reform Commission, Ministry of Finance, and the State Council's Legal Affairs Office sponsored a major symposium on implementation regulations for the Renewable Energy Law. The focus included discussions about whether large hydropower should be within the definition of renewable energy (advocates pushed for keeping large hydro out of the definition). The symposium aimed to quicken the pace of formulating implementing regulations ahead of the January 1, 2006 deadline.

Mandatory Labels for Home Appliances

Starting March 1, 2005 all home refrigerators and room air conditioners manufactured, sold or imported into China must carry an energy efficiency label. To ensure effective implementation, the China National Institute of Standardization invited local energy conservation authorities and quality inspection authorities to attend training on March 5, 2005. Officials responsible for establishing the energy efficiency labeling system at the State Bureau of Quality and Technical Supervision and NDRC's Energy Conservation Division attended.

Fiscal Policies for Promoting Advanced Vehicles Technologies Conference, March 21-22, 2005, China World Hotel, Beijing.

Asia Times Online
www.atimes.com

The State of Pollution

March 16, 2005
By Florence Chan

As China steps into the year of the rooster, all its provinces have submitted their economic performance reports for 2004. On the face of it, Guangdong, Shandong, Jiangsu and Zhejiang ranked as the top four in terms of gross domestic product (GDP), with each exceeding 1 trillion yuan. But behind the fancy numbers lies the tale of a ruthless state wreaking havoc on nature for prosperity.

If the environmental damage caused by reckless economic development is factored in, the economic growth rates in these provinces could actually be negative. To whitewash their performance reports - which serve as the only criterion when it comes to assessing governance, and thus translate into promotions - local officials think nothing of laying waste to the environment, as long as they can churn out the right numbers.

Guangdong topped the list with 1.604 trillion yuan (US$193 billion) in the 2004 national GDP chart and an annual growth rate of 14.2%. Disposable incomes for urban and rural citizens reached 13,628 and 4,366 yuan, up 10.1% and 7.7% respectively from 2003. Last June, Chen Guangrong, deputy director of the Guangdong Provincial Bureau of Environmental Protection, conceded in the Communique of Guangdong's Environmental Status that environmental deterioration might have overtaken economic growth. According to Chen, 2003 saw GDP growth of 13.6% year-on-year in Guangdong, while emissions of carbon dioxide, sulfur dioxide, nitrogen dioxide and wasted water recorded increases of 10.2%, 13.6%, 14.8% and 10.3%, respectively; chemical oxygen demand (COD), an indicator of pollutants in wasted water, climbed 32%.

Shandong grabbed the No 2 slot with a GDP of 1.5 billion yuan and a per capita income of $2,000. An investment of 760 billion yuan in fixed assets made the province the second-best performer. But when it comes to carbon dioxide emissions, Shandong is king. In April 2003, Wang Wenxing, a researcher at China's Academy of Engineering, pointed out that Shandong emitted more than 180 tons of sulfur dioxide annually, leaving all peers far behind. Shandong ranks sixth on the national list for fume and aerosol emissions, fourth in wasted water, fourth in COD and fifth in solid industrial waste.

Jiangsu's story is pretty much the same. A report on local rivers released last December by the Provincial Department of Environmental Protection showed that Jiangsu's water resources, including some waterheads, are all heavily polluted, its aquatic ecosystem is seriously destroyed and, worse still, many species are on the brink of extinction. More than 50% of sources for drinking water were found contaminated, 73.3% of the 45 monitoring stations along the rivers reported heavy pollution, and local biodiversity was reported close to extinction.

The devastating pollution has put public health at risk. Zhou Jiannong, head of Jiangsu Tumor Hospital blames the increasing number of cancer patients on the deteriorating environment. According to Zhou, cancer deaths have increased 18.31% and 11.03% in urban and rural areas in the 10 years between 1991 and 2000. Lung cancer is rampant, climbing 29.38% and 47.73% in urban and rural areas. Cases of breast and bladder cancers have also jumped. Nine counties in Jiangsu were found among the top 30 with the highest death rates caused by cancer.

Zhejiang's GDP has gone up by 14.3% to 1.124 trillion yuan. From 1978 to 2003, the province achieved an annual GDP growth of more than 13.1% and per capita income skyrocketed from $40 to $2,440. But Zhejiang is also a top polluter. An official in the State Environmental Protection Administration admitted last December that the spate of coal-fired power plants - a fallout of the nation's thirst for energy - led to galloping emissions of sulfur dioxide. Three of the six cities that recorded over 90% acid rains are in Zhejiang.

Statistical authorities said in December that 2003 recorded 2.703 billion tons of wasted water, 1,043 cubic meters of industrial exhausted gas and 197.6 billion tons of industrial solid waste. That is, for every 100 million yuan Zhejiang generates, it produces 288,000 tons of wasted water, 238 million cubic meters of exhausted gas and 4,500 tons of solid waste. Compared with 1990, the three indicators increased 84.8%, 300% and 130%, respectively, in 2003. Ironically, the province invested 23 billion yuan to guard against pollution in 2003, a paltry 2.5% of its then GDP.

As researches indicate, the permissible limit of sulfur dioxide emissions should be 12 million to 14 million tons if China wants to rid itself of acid rains. But the nation is emitting 28 million tons of sulfur dioxide into the air. Currently, China loses 110 billion yuan every year because of acid rains. Obsessed with higher growth, China has failed to take into account the toll it is taking on the environment. This oversight has weakened sustained economic growth momentum and is leading to environmental degradation.

In order to cope with such problems, the World Bank has developed an alternative macro-indicator - environmentally adjusted gross domestic product (green GDP). The ratio of green GDP to the standard GDP is an indicator of a nation's environmental health. "Calculated in this way, China reports a negative GDP growth," said Li Peilin, a researcher of the Chinese Academy of Social Science. Since its foundation in 1949, communist China's GDP has grown 10 times while its resource consumption has gone up by over 40 times. Considering the way Beijing's bureaucratic evaluation works, that seems inevitable. All that government officials really care about is economic growth, as that is the real determinant of how far they move up the ladder. In February 2004, Chinese Premier Wen Jiabao reiterated the importance of sustainable development and suggested assessing officials' performance in environmental protection as another indicator for promotion - but in vain.

Experts: Kyoto Protocol More Positive Than Negative for China

www.chinaview.cn
February 17, 2005

BEIJING, Feb. 17 -- The Kyoto Protocol on global warming has officially gone into effect with 34 industrialized nations legally bound to control their emission of greenhouse gases.

An expert has told CRI that the protocol is a positive rather than a negative for China's development.

Under the protocol, only developed nations are currently obligated to cut carbon dioxide emissions to 5.2 percent below their 1990 levels.

China, which has approved the Kyoto Protocol, isn't obligated to cut carbon dioxide emissions during the pact's first phase, which ends in 2012.

However, experts say China will come under pressure over environmental issues nonetheless.

Yang Fuqiang is the chief representative of the Energy Foundation in Beijing.

"The Kyoto Protocol has a strong impact on the Chinese economy development and policies towards the climate change."

China is now the second largest carbon dioxide emitter in the world after the US.

At its current growth levels, China is likely to surpass the United States in greenhouse emissions by 2030.

Dr. Yang Fuqiang says China's high output of greenhouse gases is mainly due to poor energy efficiency, which puts burdens on the country's limited energy resources, public health, and economic development.

He says participation in the Kyoto Protocol provides China an opportunity to achieve sustainable development.

"For the countries ratified Kyoto Protocol, they have to do something to cut carbon emission, so they'd like to make cooperation with China, and find any opportunity to improve the energy efficiency to cut the carbon emission. In this case, I think it will be another opportunity for China, introducing the international best practice, international advanced technology and other policy issues to help China to reduce the energy consumption."

The Kyoto Protocol was negotiated in Kyoto, Japan in 1997 and ratified by 141 nations.

Its aim is to reduce the emission of carbon dioxide and other greenhouse gases tied with global warming.

Back to 'Circular Economy'

Asia Times
May 10, 2005

HONG KONG - In the old days of the socialist command economy in China, when scarcity of goods was the order of the day, almost everything was recycled: packaging, clothes, car parts, building materials, and human, animal, and plant waste. Now China's leaders are trying to re-inject that ethos into the world's fastest-growing economy, but with little success so far, experts say.

In mid-2004, the State Environmental Protection Administration (SEPA) began recycling a concept that has been around for a long time in China's policy-making circles - that of a circular economy, in which optimum reuse of materials and resources is achieved, boosting the green GDP index recently unveiled by the agency. "The concept of a circular economy certainly is not new. I think there's been a lot of discussion over the past several years," Elizabeth Economy, director of Asian studies at the Council on Foreign Relations in New York, said in a recent interview.

New leaders, cleaner growth

"Environmental activists see an opportunity at this particular point in time, an opening with the new leadership of President Hu Jintao and Premier Wen Jiabo to try to advance their interests by linking environmental interests with economic interests," said Economy.

But experts agreed that in China, repetition of a concept or slogan doesn't necessarily translate into increased action. Richard Ferris, an environmental attorney at the law firm Beveridge & Diamond in Washington pointed to other high-profile campaigns in state media that had yielded little in the way of concrete results, such as initiatives to improve labor conditions or mine safety.

High-profile events such as the opening of the West-East gas pipeline to Shanghai have been highlighted for their environmental benefits in decreasing air pollution from coal, Ferris said. But little attention has been paid to other sources of pollution, such as the 40% increase in China's oil imports this year. "Yes, there will be potential environmental benefits from this pipeline project, but they're offset by the challenges, for example, with regard to [their] use of coal and energy production or fuel imports, that kind of thing."

Tighter EU-inspired rules

But Ferris also pointed to a number of new recycling rules either in the works or under consideration, such as the return of wastes from used electronic products. Some of these may be related to trade with the European Union, where similar practices are in force, he said.

Economy said actions are usually difficult to match with words in China, especially regarding environmental protection at the local level. "I expect that we'll see some ideas of clean production or industrial ecology - the kind of things that are embodied in the idea of a circular economy - see some of those things implemented in some places, but we're a long way away from wholesale adoption."

Some observers were more optimistic. David Moskovitz, director of the Regulatory Assistance Project, a US non-profit research group that works on conservation issues in China, said the government had already set new national efficiency standards for air conditioners in September and new "Euro II" standards for automobile emissions in Beijing. It also imposed fuel economy standards on new cars for the first time in September.

"More and more high-level officials are becoming aware of the very large cost that the heavy pollution load in China is imposing on their people and on their economy," Moskowitz said. "I suspect it's really laying the groundwork for even more serious environmental protection actions that will be taken in the coming months."

South China Morning Post

Green Power Law Gets the Go-ahead

March 2, 2005
Ray Cheung

The go-ahead has been given to the mainland's first renewable energy law, creating a framework for the government to promote environmentally friendly technologies to meet the nation's surging demand for power. On Monday, the National People's Congress Standing Committee passed the legislation calling for the government to adopt an array of preferential policies encouraging the development and use of wind, solar, geothermal and small-scale hydroelectric plants. To come into effect next year, the law includes an array of government-backed financial incentives such as funds for research and development, as well subsidies and tax incentives for clean-energy projects. It also calls on suppliers to buy power from producers of renewable energy, with the increased costs to be passed on to consumers. Wind power costs up to 0.5 yuan more per kilowatt-hour than electricity produced by coal-fired plants. While calling the law a step in the right direction, proponents of renewable energy say the legislation is not strong enough to significantly boost the use of related technologies. The law does not describe the measures in detail, nor does it require a specific portion of the nation's energy supply to be provided by clean technologies. In its initial draft, the legislation set a goal of drawing 10 per cent of the nation's power from renewable sources by 2010. Yang Fuqiang, chief representative of the US-based Energy Foundation in Beijing, said the law lacked concrete proposals and many initiatives were left to local governments to interpret and implement. "Who is going to say which policies are in accordance with the law? It should not be up to the local governments but the law to give explicit instructions on how to promote renewable energy," he said. Dr Yang said many of the law's more stringent measures had been dropped as a compromise between various government and energy interests. Meng Xiangan, of the China Solar Energy Society, said he wanted to see more explicit measures on promoting renewable energy in rural areas and in construction. The law contains only brief mentions of these two sectors. "Many villages still don't have electricity and must cut trees for power, while the construction industry is very inefficient. These are very critical areas for China. The law should have said more," said Mr Meng. Environmental experts say the key to law's success is whether Beijing adopts more forceful amendments and provides the financial resources for its implementation.

BBC NEWS

China Looks to Renewable Power

March 1, 2005
By Tony Cheng
BBC News, Beijing

China's government has passed a renewable energy law which is intended to increase production of energy from sustainable sources.

The law, which will come into force early next year, seeks to increase the usage of solar and wind power to 10% of China's total consumption.

However, while the new law has been welcomed, it has been suggested that the targets are over ambitious.

Rising oil prices and concerns over environmental damage prompted the move.

At present China relies on coal for most of its power, mining 1.8bn tons in 2004.

By fixing prices for electricity from solar and wind generated power, the government hopes to create financial incentives for existing operators and attract investment to these new markets.

Tough target

But while there has been rapid expansion in the sustainable energy sector, it currently provides only a fraction of China's needs.

Wind generated electricity only contributes 0.01% to the power grid. To increase that to 10% in five years is an optimistic target.

Wim Landsink of the Dannan Wind Power Company suspects it will not be attainable.

"It's going to be difficult," he said.

"There is currently a lack of power, there is a huge amount of new power capacity under development, which mainly is still coal (based). I don't think in the coming years the environmental problems will get less, they will still increase."

And there have been arguments about the definition of sustainable energy.

Some members of the governing committee that passed the bill want to include hydroelectric plants, such as the Three Gorges Dam, in that category.

Others argue that the resources and costs involved in such mega projects mean they cannot be included.

But the fact that this law has been passed at all indicates that the environmental costs of China's rapid expansion cannot be borne for much longer.

Asia Times Online
www.atimes.com

China Studying Energy Conservation Taxes

Apr 22, 2005

BEIJING - To address the urgent need for energy conservation, China's government bodies and research institutes are working on a taxation system to curb soaring energy consumption.

"We are currently doing research work for the taxation with the pertinent government departments and research institutes, and a proposal is expected to be reached within a couple of years," Yang Fuqiang, vice-president of the Energy Foundation Beijing Office told China Daily in a telephone interview on Tuesday. Yang's energy foundation renders financial support to researchers.

But the final say over when to implement the taxation system remains in the hands of the country's top policymakers, including the Taxation Administration and the National Development and Reform Commission (NDRC), say industry experts. NDRC sources said they have not participated in the environment tax preparations, but are working on various incentive-based policies to promote energy conservation, which include several tax measures. "We are studying a host of measures to encourage the use of renewable energy sources in the industrial sectors and transportation, and the preparatory work is to be completed by the end of the year," said Yu Cong, director of the Energy Efficiency Center under the NDRC's energy research institute.

The tax structure that Yang's foundation is working on will cover all sectors involved with energy use, from energy exploitation to daily energy consumption, according to researchers who are participating in the tax drafting process. Details of the taxation rates are not available, as research has not yet progressed far enough, according to Yang. "The rates are adjustable, depending on the country's GDP growth and the other economic indicators, such as the consuming pricing index."

The tax levy will start with sectors that make less efforts to implement relevant policies, according to an insider. "It is easier to impose environment and energy consumption taxes on products that have little impact on the nation's economy, say, refrigerators and motors," said Yang.

But referring to the carbon tax which is to be slapped on sectors such as power and petrochemicals that emit carbon dioxide, which would have a far-reaching effect on China's economic development drive, Yang said research and coordination work will take much longer, and will be much more complicated. "It will take at least five years for the carbon tax to take effect."

The tax measures are believed by insiders to be able to effectively enable the world's fastest-expanding economy to restrict its massive consumption of energy. "Taxation is the most powerful tool available in a market economy in directing a consumer's buying habits, [superior to] government rules or orders," said Wang Fengchun, deputy-director-general of the research department under the National People's Congress Environmental Protection & Resources Conservation Committee. But finalizing a complete environmental taxation system, especially in China's energy sectors, will take a long time, Wang added.

He attributed the setbacks to the country's large population and huge economy, which mean balancing the interests of different groups of people and various industrial sectors is very difficult.

The world's second-largest energy consumer after the United States vows to save energy equivalent to as much as 400 million tons of coal by 2010, and aims to reduce energy use by 2.2% annually during the period, according to the medium and long-term energy conservation plan hammered out by NDRC at the beginning of 2005.

China is the second biggest producer of greenhouse gases

China Fuel Tax its Best Weapon to Check Oil Demand

March 30, 2005
Chen Aizhu
Reuters

SINGAPORE - China's energy planners are ready to take the bitter pill of an unpopular nationwide fuel tax to put the brakes on runaway fuel demand in the world's second-biggest oil consumer. Analysts say Beijing is likely to consider a 20-50 percent tax on retail gasoline and diesel prices, which are among the world's lowest, emulating western Europe's policy of using high taxes to promote energy conservation and protect the environment. But imposing a tax at a time of record-high oil prices could hamper key economic sectors and anger the country's hundreds of millions of farmers, consequences which may delay any imminent implementation despite a surging dependence on fuel imports. "Beijing has well realised that the level of China's energy use demands a high tax levy. It will not be imminent but will be soon -- in a year or two," said Yang Fuqiang, the Beijing chief of the US-based Energy Foundation, which assists China in formulating sustainable development policies. Analysts say China may opt to introduce the new tax in phases to allow consumers to gradually adjust to higher costs and avoid any big negative impact to business and industry. But Beijing would have to boost prices by at least 25 percent to make a perceptible dent in demand, they say. China's oil imports hit a record in 2004, making up more than 40 percent of its 6.4 million barrels per day (bpd) of demand. That dependence is set to rise to roughly 65 percent by 2020. Swelling car ownership, sharply growing transport and petrochemical sectors, and a persistent power shortage drove consumption up almost 16 percent last year.

IMPORT DEPENDENCE

Demand remained robust despite international crude prices soaring past $50 a barrel as Beijing kept a rigid cap on retail prices to keep inflation in check and protect consumers. The government raised retail gasoline prices last week by 7 percent, the first increase since August but viewed as too little too late to have any significant impact on demand. Analysts say China would do its best to implement

A fuel station in Zhengzhou, central China's Henan Province, displays oil prices amid speculations that oil price hike is expected. CHINA DAILY, October 14, 2004)

a new retail tariff with prices at peak levels if it is really going to tackle its growing dependence on foreign oil. "The best time to introduce taxes is when prices are high to curb demand and promote new technologies," said a senior tax researcher at State Council, who declined to be named. Yang from the Energy Foundation said the government should be confident that the world's seventh-largest economy could prove to be more resilient than expected to absorb higher prices. "It's like you catching a cold. But it will help improve your immunity," he said. Finance Minister Jin Renqing said this month Beijing was determined to enforce the fuel tax, but the timing was crucial. "The government is worried a big jump in oil prices may slow growth in key economic sectors. They don't want to see taxi drivers go on strike and trucks blocking up highways," said Yang.

NO MORE CHEAP OIL

Higher fuel costs may encourage the ballooning, but minority, young middle-class to buy energy-efficient, low-emission vehicles instead of gas-guzzling sport cars. But a sharp drop in car sales would hurt the auto-making sector, one of the country's cornerstone industries and a key tax revenue source for 80 percent of Chinese provinces. A big jump in the price of diesel would raise costs at manufacturers, which ship goods from the poorer inland regions to the booming coast for export. It would also threaten stability in China's 800-million strong rural community, which uses the fuel for ploughing and irrigation. Diesel makes up a third of total Chinese oil demand, double that of gasoline. The idea of a fuel tax was initiated in 1994, when oil was below $20 a barrel, as a means of replacing road tolls. But volatile prices and issues such as how to split tax revenues among government agencies have held it up so far. "Oil prices can't possibly go back to $25 a barrel. Shall we wait forever?" said Yang Zhigang, head of tax research at the China Academy of Social Science. China levies a 17 percent value-added tax and a fixed consumption tax of 117.6 yuan ($14.2) a tonne for diesel and 277 yuan a tonne for gasoline. The consumption tax accounts for 6 percent of the retail gasoline price and 3 percent of diesel's pump rate. These are sharply below tax rates of most OECD countries at 20-70 percent, which includes VAT.

Beijing Takes Tough Measures on Air Pollution

April 5, 2005
China Daily

BEIJING, April 5 -- Beijing municipal government will adopt 22 tough new measures to control air pollution this year, building on the progress achieved over the last six years.

The new measures include stricter controls on industrial smoke, automobile exhaust fumes and construction dust.

Other measures include relocating some heavy polluters - such as coking plants in southeastern suburbs - out of the city area.

Automobile emissions, which are an increasing threat to the city's air quality as the number of motor cars rises, will be put under more rigorous supervision and control this year, according to the Beijing Municipal Environmental Protection Bureau.

Motor vehicles that meet emission standards usually have a yellow or green tag pasted on their front windows after an annual inspection. However, cars without such tags are often seen on the roads.

This year, the municipal environmental protection bureau will team up with local traffic management authorities to guard against vehicles without such tags on the road. People driving such cars will be fined 200 yuan (US$24), said Pei Chenghu, deputy director of the bureau.

Pei said the city plans to phase out 3,800 old buses and 20,000 taxis, both blamed as major pollution sources, by the end of this year.

The cost of changing the buses alone is expected to reach 3 billion yuan (US$363 million), according to sources with the Beijing Public Transport Group.

All new buses and taxis must meet Euro III emission standard, said Feng Yuqiao, chief of the Air Pollution Prevention and Control Division under the bureau.

Experts say emissions from one old car is the same as from 14 new cars that meet this new standard.

Feng said the city is expected to upgrade its exhaust standard from Euro II to Euro III this year, and special petrol suitable for Euro III cars will be on sale in July.

Emission Standard

Beijing adopted the Euro II emission standard in 2003, and the speedy upgrade is because of urgent appeals for clean air, and due to the soaring number of vehicles, said Feng.

Apart from exhaust fumes, the city will also take tough measures to slash industrial emissions, which are another major source to air pollution.

A second batch of heavy polluters, that could include more than 20 industrial plants, is expected to be told to clean up operations this year, said Pei.

His bureau made public the first batch of 28 heavy polluters last June, which produced a total of 78,000 tons of sulfur dioxide and 13,000 tones of dust and smoke annually.

All the 28 blacklisted enterprises, mainly engaged in electricity and heating supply, and petrochemical and steel-smelting industries, had adopted measures to reduce their emissions by the end of last year, according to the bureau.

The steel giant Shougang Group, which has long been blamed as the biggest industrial polluter in Beijing, has been ordered to close down a blast furnace before July and a coke oven by the end of this year.

Ji Lin, vice-mayor of Beijing, said at a conference last month that Shougang should try to remove all its pollution-producing plants out of Beijing by 2008.

The relocation of Shougang, which has been discussed for nearly a decade and was finally decided early this year, is expected to cost at least 50 billion yuan (US$6 billion).

"If the relocation project cannot be finished before 2008, all its smelting operations will be suspended during the 2008 Olympic Games," said Ji.

This year, the city vows to ensure 230 days meet good or excellent air quality standards. That means air pollutants, such as sulfur dioxide, nitrogen oxides and suspended particulate, are kept at a low level.

Chinese commuters make their way in heavy smog in Beijing, December 14, 2004. Thick smog blanketed Beijing, spotlighting the city's uphill battle to curb pollution before it hosts the 2008 Olympic Games.
REUTERS/Reinhard Krause

WIRED MAGAZINE

China's Next Cultural Revolution

The People's Republic is on the fast track to become the car capital of the world. And the first alt-fuel superpower.

April 2005
Lisa Margonelli

The Challenge Bibendum is the anti-Nascar, a road rally where dozens of cars, two-wheelers, and buses vroom the straightaways like a pack of DustBusters, cough out water vapor instead of sooty exhaust, and corner at peak speeds of 35 mph. Named for the morbidly obese mascot of Michelin, which sponsors the event, Bibendum is the proving ground for alternative-fuel and low-emissions vehicles.

For the first five years of its existence, the rally was staged in rich cities with bohemian tendencies - San Francisco, Heidelberg, Paris. But last fall Michelin brought the Bibendum to Shanghai. The booming Chinese auto market, which grew by 76 percent in 2003, is an obvious lure. It's a market still under central control - for the moment, anyway - which means that if Beijing wants to go green, it can go in a huge way. And so in Shanghai, Bibendum lost its utopian vibe. The stakes were simply too big: What will 1.3 billion people drive?

The answer, believes professor Huang Miao Hua, is an electric car prototype made by her students at the Wuhan University of Technology. The Aspire (not to be confused with the Ford compact car) is a giddy marriage of tadpole and pickup truck. The $12,000 target price includes a Linux OS, GPS, and an onboard bicycle. A bike? If you get stuck in gridlock, Huang explains, you can park the car and pedal instead. Think of it as a concept car for traffic jams. She pushes up the Aspire's door (it opens vertically, for parking in tight spots) and smiles. "Get in," she says. As it lumbers to a start, engine whining under the strain, my driver shouts, "It's got a few problems, but it feels good, doesn't it?"

In the West, clean cars mostly have been the toys of wealthy worrywarts - too expensive to be economical and too technically challenged to be cool. China's feeling an urgency that slower-growing countries don't face. The demand for oil is skyrocketing, rising even faster than the price. And here's the eye-opening stat: In the absence of new regulations, pollution-related illness will suck up as much as 15 percent of the country's gross domestic product by 2030.

China's central planners are throwing everything at the problems of fuel and pollution - hybrids, electric cars, propane taxis - all while building conventional cars and infrastructure at a furious pace. "There's a controversy about 'Green GDP' and how to grow," says He Dongquan, a transportation expert at the Energy Foundation in Beijing. "China's in a transition where everyone's mind is changing." Amid the hurly-burly, the only thing that's clear is the future, where hydrogen beckons.

China is already taking bold steps toward an alt-fuel future. In late 2003, Beijing mandated some of the world's toughest fuel-efficiency standards. China is even now one of the largest markets for alternative fuel vehicles, with 200,000 in

service. In preparation for the 2008 Olympics, Beijing officials plan to convert their entire bus fleet of nearly 120,000 vehicles to run on compressed natural gas (CNG).

All this opens up vast opportunities for automakers. The major car manufacturers (with the exception of Honda) have come to Bibendum to show that they're ready to play China's game, whatever it turns out to be. Toyota will begin producing hybrid Priuses in Changchun by the end of the year. GM, which made 15 times more profit per sale in Asia than at home in 2003, will manufacture hybrid buses for Shanghai. "This will be the biggest market in the world by 2010," says Dongfeng Citroen chief Gilles Debonnet, standing beside a CNG car his company designed for Bibendum. "If we don't bring a [low-emissions] solution to the taxi market, then we can't stay."

Decades behind developed nations when it comes to supporting a car culture, China may actually benefit from its very backwardness. All those bicycles mean there isn't a cumbersome - and entrenched - gasoline infrastructure to stand in the way of the next big thing. That's why China hopes to eventually bypass the oil-based auto culture and go right to a hydrogen economy. "Some theorists believe China has an advantage with fuel cells because it has no resistance," says General Motors vice president David Chen as he attends to a Shanghai dignitary at Bibendum. "It's been cut off from the world for 30 years. It may be in a unique situation to leapfrog."

Leapfrogs are an intoxicating vision, but can this one really jump? "We consider China a wild card," says Shell Hydrogen VP Gabriel de Scheemaker, who installed Iceland's hydrogen infrastructure and is now at Bibendum trying to get into the Chinese market. His eyes get dreamy as he imagines Shanghai on H2 - city blocks powered by fuel cells, cars filled from hydrogen supplies embedded in buildings: "In Deng's day, he experimented with whole cities!"

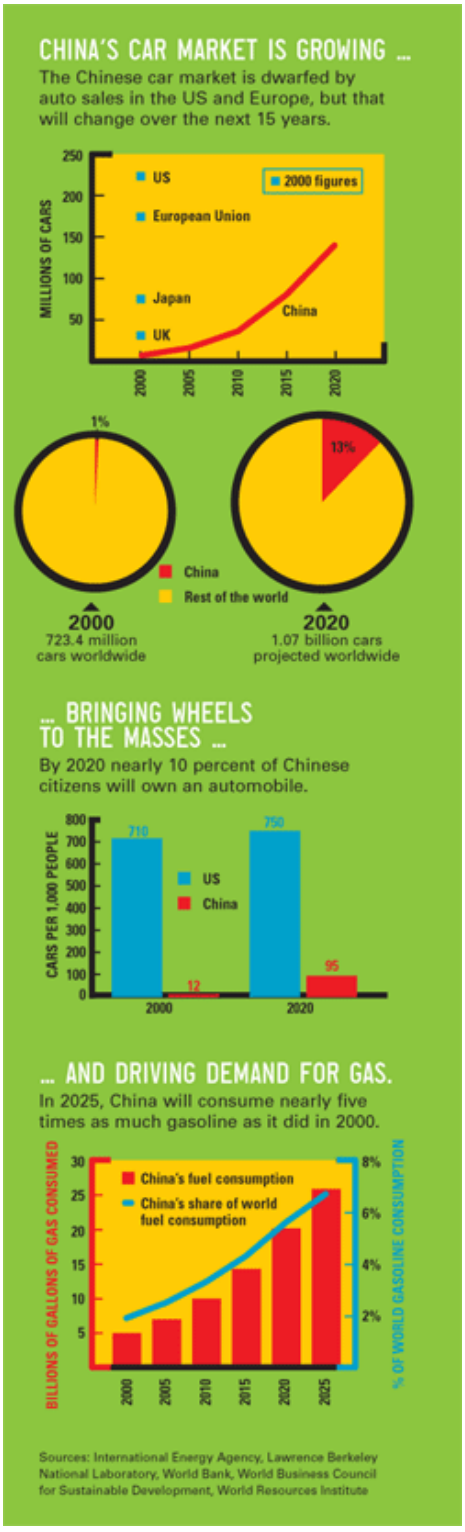
Although China's in an experimental mood, innovations are hard to finance. The Aspire bobbles toward Shanghai's Formula 1 track, past Toyota's Prius, Volvo's lozenge-shaped 3CC concept car, and the Mercedes-Benz A-Class F-Cell, which has its magnificent fuel cell guts jammed into a frumpy hatchback. The team from Wuhan is taking on the big guys with two goofy Aspires made for a total of $60,000.

The six-day Bibendum turns out to be a coming-out party for China's homegrown clean cars. The Aspire wins a special design prize. And of the 43 Chinese vehicles entered, 19 - including 11 two-wheelers, six buses, and two cars from an array of fuel sources - score very high on the Bibendum tests of overall emissions, CO2 emissions, noise, fuel economy, braking, slalom, and acceleration. A year before, there wasn't even one Chinese entry. "We wanted to do something good for the country," Huang says, her students giggling with excitement as they push the little car out of the garage for the trip back to Wuhan. "My students gave without expecting any return. That's the spirit!"

Here's the new cultural revolution: Every morning Wang Jian Shuo and his wife leave their condo in the suburbs of Shanghai, get into their Fiat sedan, and drive to jobs in the city. Two years ago, they lived in a cramped, decrepit apartment in the center of Shanghai, and Wang, an engineer for Microsoft, traveled to work by bus or train. "I never thought of getting a car," he says. "Driving was a very serious profession - like medicine." Cars were for party bureaucrats, or at least the very rich.

But in 2000, Shanghai's per capita GDP (already much higher than China's overall) rose above $4,000, and the roads started filling with private cars. Local highways, which were designed by engineers who'd never driven, clogged. Shanghai's narrow streets became so congested that commuters abandoned their bicycles for the subway just to avoid the cars. Smog grew so thick that on many days you couldn't even see the boisterous skyscrapers looming above you.

And so, a year ago, Wang moved into a spacious condo in the suburbs - and bought a car. "The change the car brings my life is bigger than the house," he says. "My life scope is much larger now." Today Wang and his wife shop in Western-style supermarkets instead of haggling with the fishmonger, and they can drive to visit friends and return home by car long after the subway has shut down for the night. They grew up in a world bounded by transit schedules, shabby housing, and nosy neighbors, but now they live in an airy apartment, surrounded by the brand-new high-rises that have sprung out of the rice paddies. Some nights, when they're tired, Wang and his wife get in the car and drive out to the new airport just to experience speeding down the empty highway. But even that road is filling up. It makes Wang happy he bought a car as soon as he did. "When a car becomes something everyone can afford, forget it," he says. "You won't be able to drive."



At a Hyundai dealership not far from Wang's condo, families prowl the showroom, inspecting the stitching on the seats, criticizing the design of the rear lights, trying to find the biggest car for their yuan. A TV blares a government program featuring a singer in a yellow dress crooning in front of a suburban development. "Nowadays life is getting better, sweeter and sweeter," she sings. "You can fulfill your dreams. The roads are getting wider and wider."

Managing dreams is a big problem for the Beijing bureaucrats who pull the levers of China's economy. Yang Yiyong is low enough in the party hierarchy that he'll talk with a foreign reporter, high enough that he insists on meeting in the backroom of a restaurant famous for its duck with stewed fruit. His official title is deputy director of the Institute of Economic Research, a government-sponsored think tank.

Yang wears a serious pin-striped suit and talks big numbers. China's population, he says, will approach 1.5 billion in 2030. The only way to forestall economic calamity is to maintain 25 consecutive years of high annual GDP growth. That kind of growth, in turn, requires massive amounts of energy. Already the world's second-largest oil importer, China is expected to more than double imports by 2020. This is a painful subject for Yang, who fulminates against cars, car culture, traffic, and the prestige his countrymen are attaching to big cars. "I object to this vague notion of status," he says.

His concern is ideological, but the problem is practical. After food, oil is the most important issue for Chinese economic planners. Without an increasing supply of oil, high GDP growth will be impossible, creating unemployment and social unrest, potentially threatening the government's hold on power. That's not all. Dependency on foreign oil, in Yang's opinion, inevitably leads to war. Every official I interview makes the same point. Yang uses a pun to summarize the leadership's view: "If you pump for oil, you have to fight wars for it." (Pump and fight sound similar in Mandarin.)

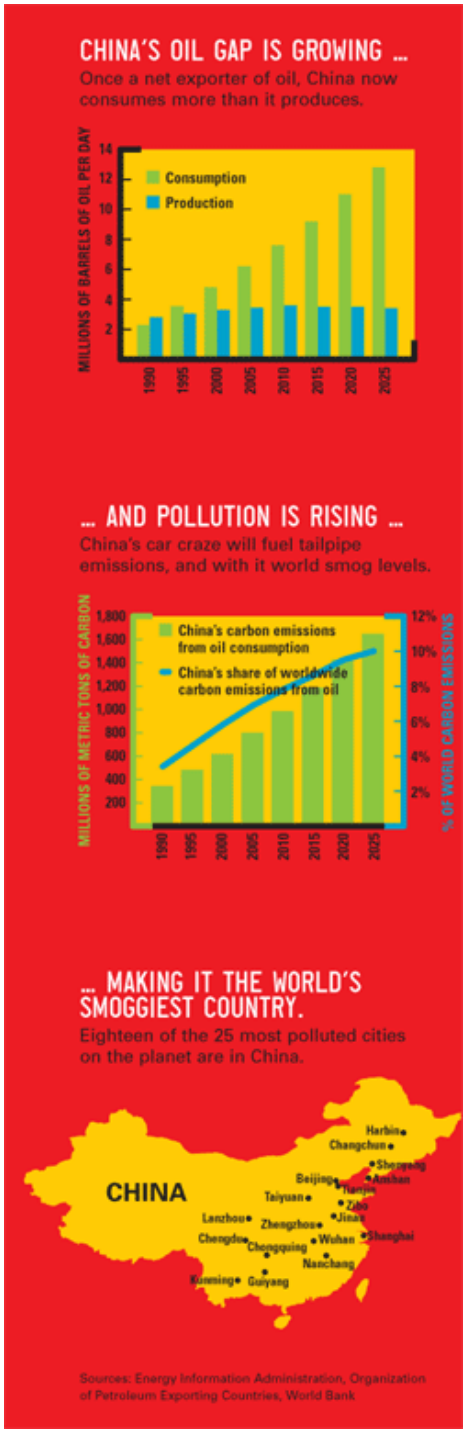
In the face of an oil crisis, the government is embracing fuel efficiency and alternative energy resources. In every scenario, oil imports will rise, but the hope is that new technologies and conservation will minimize the rate of growth. The plan is to replace 10 percent of China's energy supply with renewable sources by 2010, 12 percent by 2020. (Today, less than 1 percent comes from renewables.) "We're not saying we can reduce consumption," he cautions, "but we can reduce the increase and win some time."

A chauffeur-driven Audi A6 stops near the Mao statue facing the gates of Shanghai's Tongji University, and Wan Gang steps lightly out of the back. He is a compact man in his early fifties who retains the enthusiasm and pink cheeks of a boy genius. As the chief scientist of the 863 Program's Key Electric Vehicle Project (the 863, named for its approval date, March 1986, is China's national high tech R&D initiative). Wan has to get Chinese industry mass producing fuel cells by 2020. It's an ambitious national agenda that started in 2001 with an unambitious budget: $106 million. That figure must sustain the network of 200 universities and companies that are developing and testing scores of electric, hybrid, and fuel cell vehicles.

The fuel cell mission is borne partly out of necessity. In 2000, China's Ministry of Science and Technology contacted Wan, who was living in Germany for a decade doing research for Audi. The ministry asked him to come back and create a strategy for the overall Chinese auto industry. Wan concluded that it would be futile to try to compete with the West by building a better or cheaper internal combustion engine. Getting a head start in fuel cell technology would be the country's best bet. But still a long bet.

Wan, who is also the president of Tongji University, convenes his interview with me in a giant Mao-modern formal room. The tractor-sized chairs inhibit normal conversation so he quickly moves us to a utilitarian conference room, indistinguishable from one you might find in an office in Berlin or New York. Wan lays out a 15-year plan that will lead to fuel cell cars, putting China at the forefront of the hydrogen economy. He pulls out a piece of paper. "I'm trying to demonstrate that the picture is reasonable and practical," he says, sketching a grid.

The grid contains four major fuel types: electric, hybrid, CNG, and hydrogen. Hydrogen, Wan explains, is a glorified battery, a way to store energy from various sources - coal, solar, nuclear, or hydroelectric - until it's needed. He draws a circle lassoing the hydrogen and electric columns. Today's investments in electric car R&D, he argues, will still be paying off in a hydrogen fuel cell-powered future.



Likewise, hybrid technology, Wan explains, is all about fuel efficiency. For example, advanced hybrids brake by forcing the electric motor to spin backwards, generating energy that's stored in the battery. "Engineers in the States say hybrids are transitional, but I believe the technology will last a long time," he says,

drawing arrows across the grid to show how regenerative braking technology will make both electric- and hydrogen-powered cars more efficient.

CNG cars will require a network of gas pipes connecting refineries to filling stations. But natural gas, he explains, can be converted easily to hydrogen. And with one final pencil stroke, the whole chicken-and-egg problem of hydrogen cars versus hydrogen infrastructure is gone. Wan holds up the grid, covered in optimistic arrows, and declares, "China has the advantage of not being burdened by previous investment."

China is waving its big, red wand, but will a hydrogen economy pop out of this hat? "It's lovely to forecast out 15 years," says John Wallace, an American fuel cell consultant working with clients in China, "but nobody remembers." Wallace is fond of Wan Gang, and admires the 863 Program's "credible" technology and pluck. But he says no amount of determination can summon the resources that China needs to make hydrogen vehicles a reality: startup infrastructure, niche technology companies, and venture capital firms.

Those resources may be coming. Venture capitalist Mike Brown, chair of Canadian fuel cell investment firm Chrysalix Energy, is looking at China. "Wan's plan is eminently doable. If they went balls to the wall, they could do even more," Brown says. "The big question is whether the government will have the nerve to scoop the world."

In the lobby of one of Shanghai's vast Epcot Center-like hotels, Cai Xiaoqing taps his foot restlessly. He wants to jump-start the hydrogen economy immediately. With an astronaut's brush cut of salt-and-pepper hair, Cai looks the part of the former space program technocrat he is. As director of the Equipment Industry Department for Shanghai's Municipal Economic Commission, his job is to make Shanghai the Detroit of China.

Like everyone else here, Cai speaks in billions and of far-off years, but he's more impatient than most. He can't wait for a homegrown fuel cell. Cai wants Shanghai to quickly move to hydrogen. But how do you start a hydrogen economy without a hydrogen car?

Cai looks abroad and sees foreign auto manufacturers sitting on piles of expensive fuel cell technology with nowhere to test it. In California, they've been reduced to clownish stunts like putting a fuel cell in Arnold's Hummer. Cai can do better than that.

Bouncing slightly, Cai pitches Shanghai as a test track: 10 fuel cell cars in circulation by the end of this year, 1,000 by 2010, and 10,000 by 2015. But making hydrogen cars a reality by 2020 will require government investment in technology and subsidies to consumers. Cai calls it "a long step." Others say it's impossible. But consider the payoff: clean cars ready for export just as the rest of the world starts to choke on pollution and gasoline supply problems.

To provide the fuel cells, Cai has his eye on General Motors, which has poured more than a billion dollars into a hydrogen-powered fleet but has nowhere to drive it. "If China develops the infrastructure, GM would put those cars to use," Cai says, "I think they see China's big market, too."

In fact, they do. For more than a year, Tim Vail, GM's director of business development in charge of commercializing fuel cells, has been traveling to China and liking what he finds. He looks at Shanghai's propane taxis, 38,000 in all, and sees an industry ready to experiment. He looks at Shanghai's $1 billion maglev train and sees a city that's ready to spend. He looks at a coal-processing plant in the city and sees a source of industrial hydrogen that should last for the next 15 years. But most important, he sees a government that's ready to do the social engineering needed to speed the adoption of fuel cells. To Vail, Shanghai's ridiculously crowded city center, where the nouveau riche compete to conspicuously outconsume each other, is a plus. "You would see well-heeled people buying fuel cell cars if they had enhanced rights," he says. "More than anywhere else, Shanghai could say, 'Only fuel cell vehicles [in the downtown]' without a lot of debate."

Last October, GM chair Rick Wagoner shook hands with the vice mayor of Shanghai. They agreed to codevelop a fuel cell demonstration vehicle and help write the standards and policies for hydrogen power and infrastructure. Meanwhile, Volkswagen endowed a chair at Shanghai's Tongji University and agreed to jointly research fuel cell technology. "It's strategic positioning at this point," says Chris Raczkowski, a top Beijing-based

Drivers wanted: Huang Miao Hua, with two of her student designers, shows off the Aspire prototype.

alternative energy consultant, "but some companies may get a captive market for their products, and that's really the only way to get a market jump-started."

The day after the GM deal is struck, local dignitaries gather at the Shanghai International Automobile City in Jiading to celebrate this triumph of focus and vision. Four years ago, Jiading was a suburban farming village. Out went the farmers; in came the $300 million F1 racetrack (site of the Challenge Bibendum), Tongji University's College of Automotive Studies, 6 square miles of automotive-themed industrial park, and a golf course.

A band plays "Remember the Red River Valley," and Wan Gang takes the stage to reminisce about the eight years he spent in the countryside during the Cultural Revolution. Back then his work crew built an entire town from scratch: the roads, the electrical grid, farms, even a hospital. Yesterday they built Motor City. Tomorrow they'll build a hydrogen economy.

Across the hall, the 863 Program unveils its newest prototype, the Spring Light 3, a fuel cell-electric hybrid with steer-by-wire technology and regenerative braking. Target price: about $5,000 - the car for the new masses. While Western automakers often boast that their enviro-wagons make "no compromises," the 863 Program makes compromise its guiding principle. Like the funky Aspire, the Spring Light takes you where you want to go, without promising more. American cars are all ego, but the Aspire and Spring Light are friendly, even neighborly. They're all about getting along, not getting away.

By the end of the afternoon at Jiading, it isn't the Spring Light or the VIPs that are making the big impression. It's Wan's preview of Tongji's new dormitories, complete with hot water and Western-style toilets. The engineering students see the bathrooms and let out a loud gasp. Their reaction is part awe, part appreciation, part anticipation of a new world that can only be better. Does the hydrogen highway start here? Maybe. Maybe your future and mine is being created by people desperate enough to imagine it.

Lisa Margonelli (margonelli@yahoo.com) is the author of the forthcoming Oil on the Brain: Travels in the World of Petroleum.

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The Big Meltdown

Something's Happening at both Poles

Colin Woodard

When Antarctica's Larsen-B ice shelf—a 10,000-year-old, 650-foot thick expanse of floating ice the size of Rhode Islandï¿1⁄2collapsed three years ago, Pedro Skvarca had a front-row seat. With the Antarctic Peninsula being swept by an unprecedented summer heat wave in February 2002, Skvarca, a glaciologist with the Argentine Antarctic Institute, jumped in a rugged twin-engine turboprop and flew off from his Antarctic research station to inspect the cliff-like seaward edge of the remote ice shelf.

What he saw, Skvarca recalls, was astonishing. "The surface of the ice shelf was almost totally covered by melt ponds and lakes, and waterfalls were spilling over the top and into the ocean," he says. Great slices of the Larsen-B's leading edge had broken off, filling the Weddell Sea with icebergs and slush. Two weeks later, almost the entire ice shelf had disintegrated. "It was unbelievable to see how fast it had broken up. The coastline hadn't changed for more than 9,000 years and then it changed completely in just a few weeks."

Now scientists studying the aftermath of the collapse say it will very likely have unpleasant implications for the rest of us. The collapse of the Larsen-B and its smaller northern neighbors, the Larsen-A and Wordie Ice shelves, in the face of warmer summer temperatures has caused the vast glaciers and ice sheets behind them to begin sliding into the sea at a remarkable pace. Aerial and satellite imagery show that the glaciers behind the Larsen-B increased their seaward flow by two to six times in the months after the ice shelf's collapse, with some of them thinning by more than 100 feet. Unlike the floating ice shelves, thinning glaciers contribute to global sea-level rise.

"The glaciers took off like a race horse after the ice shelves were removed," says Ted Scambos, a researcher at the National Snow and Ice Data Center in Boulder, Colorado. "Just a decade ago we glaciologists were talking about gradual changes in glaciers taking place over centuries. Now we're seeing things that we didn't think glaciers could do in terms of their speed of response."

And it's not just happening on the Antarctic Peninsula. Similar studies of glaciers entering the Amundsen Sea, some 1,200 miles away in West Antarctica, show them doubling their flow since the 1990s. This is especially worrying because the glaciers in this area drain the West Antarctic Ice Sheet, a precariously balanced portion of the southern ice cap that contains enough ice to raise sea levels by 20 feet. By comparison, the sea-level rise predictions endorsed by the 2,600

A view of polar ice melt from the U.S. oceanic research ship Laurence M. Gould in the Antarctic Peninsulaï¿1⁄2s Gerlache Straits.

scientists of the Intergovernmental Panel on Climate Change are only about two feet by 2100.

If anything, the news from the Arctic is even more troubling. In November an international team of 300 scientists completed an unprecedented four-year study of the region that found it is warming at nearly twice the rate of the rest of the planet. Average winter temperatures in much of the region have increased by as much as four to seven degrees Fahrenheit in the past 50 years, and they are expected to warm by another seven to 13 degrees by the end of the century. During that time, the scientists predict that half of the Arctic's summer sea ice will melt, along with much of the Greenland Ice Sheet, which contains enough ice to raise sea level by some 23 feet.

"The preponderance of evidence suggests that the warming of the past 50 years has mostly come from greenhouse gas emissions and everything we're seeing in the Arctic is 100 percent consistent with that," says Robert Corell, a senior fellow at the American Meteorological Society in Washington, D.C. and chairperson of study for the Arctic Climate Impact Assessment.

Arctic people are already feeling the effects of this polar thaw. Several Inuit communities in Canada, Alaska and Russia are washing into the sea because the sea ice that used to dampen waves is vanishing. The area covered by sea ice has shrunk by more than six percent since 1978. And in the central Arctic, submarine measurements indicate that the average thickness has declined by 40 percent in recent decades. If trends continue, scientists warn that polar bears, seals and other animals northern people rely on will be driven towards extinction.

Until recently, many parts of the Arctic were more accessible in winter, when ice roads made truck transport possible. But warmer temperatures are turning those roads into impassable tracks of mud for more and more of the year. Over the past 30 years, the Alaskan Department of Natural Resources has been forced to halve the number of ice road travel days from 200 to 100. In northern Russia, melting permafrost has damaged roads, railways, apartment buildings and airport runways and ruptured several oil and gas pipelines.

In Iceland and Greenland, glaciers have been in rapid retreat, with the Greenland ice sheet experiencing summertime surface melting over 16 percent more of its surface area since 1979. "Greenland is melting much more rapidly in the past two or three years than anyone imagined possible," Corell says. "The ice is so bad in eastern Greenland that people are killing their sled dogs because they cannot hunt enough seal to keep them."

After the report's release, Shelia Watt-Cloutier, the Nunavut, Canada-based chairperson of the Inuit Circumpolar Conference, traveled to Washington to urge the Bush administration to take global warming seriously. "By looking at what is already happening in remote Inuit villages in Alaska, you can understand the future dangers for more populated areas of the world such as Florida, Louisiana or California," she told a Senate committee hearing. "Use us in the Arctic as your early warning system."