

China Infrastructure Newsletter

MONTHLY OVERVIEW OF CHINA'S INFRASTRUCTURE SECTOR



clear thinking
solutions & analysis

Power developers face a long haul Wasting energy

Foreign investors in the power sector here are survivors, a hardy bunch who describe themselves variously as pawns, plenipotentiaries and pioneers. Doing business in China, they say, requires a bit of each, and some, even after 10-plus years of investing, have nothing to show for their toil or investment. The main reason, central government officials say sympathetically, is that foreign investors have set their sights on unrealistic rates of return on their investments. This has led local officials to exact payment in other ways, namely by unilaterally "altering" foreign-financed power plant pricing structures.

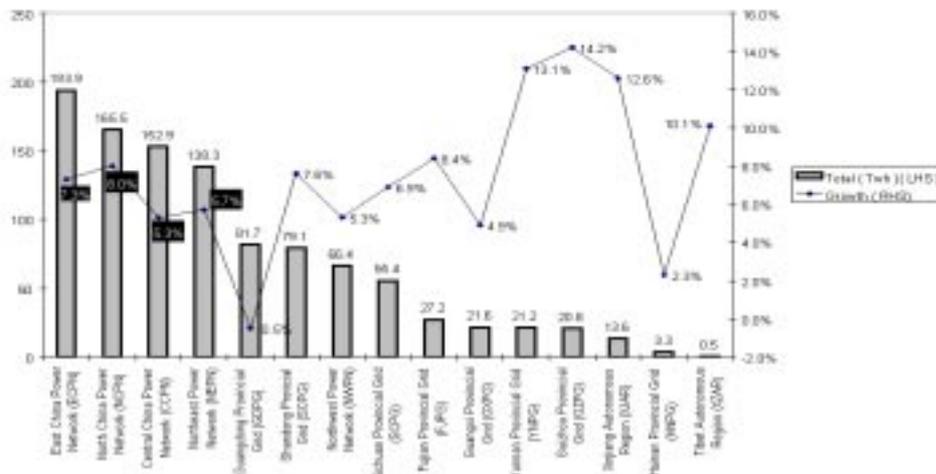
These alterations generally take two forms. At one end of the spectrum sits Enron, who despite their size and strong Beijing connections have found their Hainan Island plant shut down

due to lack of demand, a problem across the relatively well-developed south. The lesson? Do not rely on national demand forecasts when the grid only serves one island.

At the other end of the spectrum, AES suffers from a bigger nightmare. Their minority interest in a Sichuan plant is not enough to stop production, even though the Sichuan Provincial Grid refuses to pay for any offtake. Instead, the local partner's close connections to local grid managers keep Sichuan supplied with as much electricity as it needs. No calculator is needed to compute the plant's actual price per kilowatt-hour.

Similar tales of woe abound. Foreign investors realize they may make money in the long term, but first they must, as the Chinese

1996 electricity generation and growth



Source: China Electric Power Yearbook 1997, CSFB

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News briefs

The future is brighter for domestic power players...

quaintly put it, “pay their tuition fee” to learn the way the system works. AES has decided to localize its management team, with country manager Kerry Yeager relocating to Texas. Their reassessment is not alone. Illinova Power officials say their new hedging strategy is to sell off all majority positions, retaining only small percentages in the plants they have developed.

High returns

By contrast, the future is brightly lit for domestic power players like Datang Power, Huaneng Power International (HPI) and Shandong Huaneng, and for Hong Kong giants Cheung Kong Infrastructure (CKI) and New World Infrastructure. CKI, an infrastructure stock with various power plants, has outperformed everyone with a 46 percent return over the past year. Part of the reason is their relationships with electricity grid managers and power plant directors, which have kept arguments over pricing and offtake amounts to a minimum.

HPI especially seems poised to use earnings from a second listing in Hong Kong to add to its seven existing plants, and is directly owned and controlled by the State Development and Planning Commission and

the State Power Development Corporation (SPDC). Another strong contributing factor relates to the first. Because of better inside information and personal relationships, Chinese and Hong Kong investors do not demand the high returns foreign investors are demanding in return for high risk.

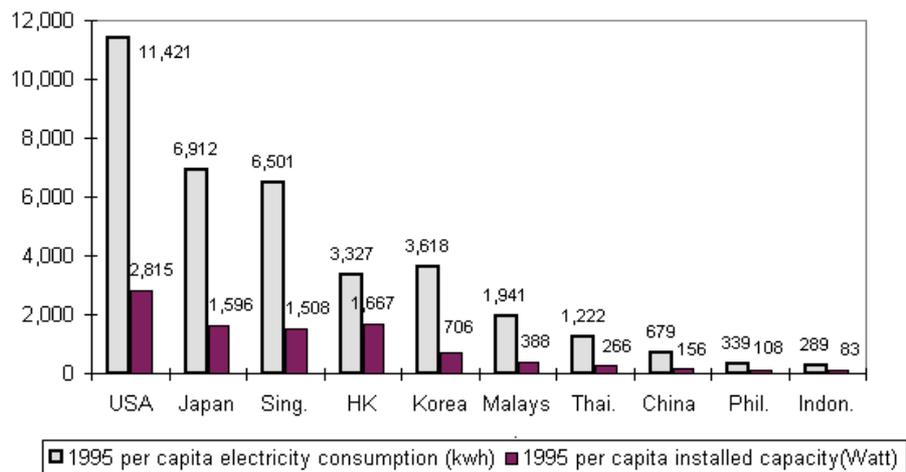
The uneven playing field has made even bigger pessimists out of most foreign power managers, reminding us (anonymously, since no one wants to ruin their chances for new projects) that power generation growth from 1992-94 was 11.4 percent, and has been slowing ever since. SPDC officials estimate an annual growth rate of 5.6 percent for the next three years. The half-empty-glass viewpoint underlines the financial difficulty of maintaining loss-making power plants in order to access better money-making opportunities in the future. So far, enforcement of pricing and offtake amounts have been the two most problematic issues, and there is little in the ongoing industrial reform process to inspire advocates the next three years will be any different.

The more thick-skinned have decided that in spite of all the problems, China remains one of the best long-term bets,

...but foreign firms can still benefit in the long term

Installed capacity growth lags behind GDP growth

Electricity consumption and installed capacity



Source: US Department of Energy, Energy Information Administration, Office of Energy Markets and End Use, International Energy Annual 1996, China Electric Power Yearbook 1997, China Statistical Yearbook, CSFB

pointing to continued strong demand in the north and west, even as demand dwindles in the southern and seaboard provinces. Officials from the State Power Development Corporation add that installed capacity growth still lags behind GDP growth, growing about 80 percent as fast as the economy as a whole. Despite the massive absolute increases in annual installed capacity (13,000-14,000 megawatts per annum), the argument goes, the amount of foreign capital needed to fulfill growing power needs is equally staggering, at an estimated \$ 4.16 billion over the next three years.

The chart (page2) shows the attraction of the China market using a straight numbers approach. In 1995, China's per capita installed capacity was a mere 156 watts, 6 percent of that in the United

States. But no matter how one looks through the glass, there is a consensus among in-country managers that numbers do not tell the entire picture. The next three years will most likely witness uneven development, with some power developers performing inordinately well.

Powerful lesson

One expensive lesson for foreign investors is that rates of return (both contracted and actual) are dropping as grids default on payments and local and Hong Kong players agree to lower returns. The other? Future projects must be majority foreign owned and controlled, with an internal enforcement mechanism built into the contract to prevent pricing malfeasance.



Rates of return fall as grids default on payments

Beijing launches national theater War of the world stage

Beijing's Avenue of Eternal Peace is home to an impressive cluster of oversized, self-important buildings in architectural styles ranging from the traditional (the Imperial Palace) to the Stalinist (the Revolutionary History Museum) to the useless (the Women's Federation Building). The newest contender on the block is the National Theater project, already attracting attention as one of the country's most prestigious projects well before bids have been tendered or ground broken.

Underlying the hype over the recent bidding in Beijing is the theater's significance in the ongoing competition between the capital and the nation's financial center to the south. Shanghai, which long played second fiddle to Beijing in terms of cultural significance, has in recent years produced three world-class structures. In 1996 the city opened a new \$75 million library which ranks among the 10 largest in the world, and the impressive \$50 million Shanghai Art Museum, which is far and away the finest museum in China. Set to open later this year on the west side of People's Square is the Shanghai Opera House, a stunning \$157 million glass-cased structure that city

leaders intend will become the premier theater in Asia.

Beijing residents consider these developments an affront to their sensibilities. After all, Shanghainese, they say, have no culture. Not to be outdone, Beijing has come up with a comprehensive new plan to develop the area around Tiananmen Square. Chief among the planned projects are the National Art Museum and the National Theater, progress on which is moving ahead at a lightning pace relative to the usual speed of Beijing bureaucracy. A Communist Party Central Committee decree last year ordered that both the museum and theater be in place before 2010, and the process has accelerated from there. In October the Central Committee formally decided on the site. In early January a leading group and proprietary committee were established to formulate the fundamentals of the plan, and within months the 19 domestic and 21 foreign bidders were selected.

The two separate wings of the National Art Museum are to sit at the southwest and southeast corners of Tiananmen Square. But

Shanghai has built three world-class structures...

...now Beijing plans its own showpiece symbol of the arts

Chinese and foreign architects are likely to share the design

the real prize is the theater, which will sit immediately west of the Great Hall of the People on a site the late Premier Zhou Enlai designated for the project when he first conceived it more than 40 years ago. The building will cover a 37,000 square meter foundation but will have an internal area of 120,000 square meters, including a 21,000 square meter subterranean parking garage and a giant 3,000 seat main concert hall designed to seat the entire 2,000-plus-member National People's Congress.

Theaters of dreams

The construction implications of this project are impressive. The Shanghai Opera House is topped by an imposing foreign-engineered single-piece roof weighing over 6,000 tons. Underneath this is a building composed of parts from all over the developed world. Glass for the building's outside walls was not only imported from Germany but installed by German workers. The stage was built by Japan's Mitsubishi, the lights came from Belgium, and the sound system was provided by American company JBL. With Beijing planning to outspend Shanghai by two times in its quest to reassume national cultural preeminence, the National Theater will offer a potential gold mine for foreign contractors.

Likewise, the Proprietary Committee for the Chinese National Theater, which is in charge of selecting the architect, will almost certainly choose an architect from among the 21 foreign bidders. Chinese law essentially requires foreign designers building in China to work in partnership with a domestic firm, so one of the 19 Chinese bidders will probably also participate.

But the chances that the committee would choose a domestic company to single-handedly design the national theater are close to zero. Officials have repeatedly stressed that they want this building to rank among the great contemporary structures of the world. In a recent speech Yao Bing, Vice-Chairman of the Proprietary Committee, emphasized that at least as important as the theater's reflecting Chinese nationality is that it "absolutely embodies

international characteristics, and reflects advanced international thinking, consciousness and technology." Domestic firms have neither the experience or the prestige to carry this off alone. As Chairman of the Proprietary Committee Wan Siquan told the official China Daily, "We want this cross-century project to represent this century's highest-level techniques, and foreign architects are more experienced in designing theaters for ballet, opera and orchestras."

Under normal circumstances leaders in Beijing tend to pay greater heed to political considerations than their southern counterparts. This would benefit a company like US bidder Minoru Yamasaki Associates, best known as the creators of the World Trade Center in New York, which has 11 projects in China totalling more than 7 million square feet and valued at more than \$1 billion. It was recently commissioned to design another of Beijing's future architectural fixtures, the proposed 100-story Beijing World Trade Center, and it is perhaps first among its peers in familiarity with the Chinese market.

But in its quest for international architectural recognition, the city is likely to give such factors far less weight. Rather than a company which specializes in high-rises and hotels, the committee will choose a firm with experience in designing the distinctive symbol of the arts that a national theater should be.

Jean-Marie Charpentier and Associates, the French firm which designed the Shanghai Opera House (but is not bidding on this project), had previous experience designing the Bastille Opera in Paris. Likewise, Jean Nouvel, a French architect who is bidding on the National Theater, renovated the Lyons Opera House and is internationally renowned for his Institut du Monde Arabe in Paris. Indeed among the foreign bidders are numerous firms with experience in similar projects, including the Italian firm SGA which participated in construction of the Sydney Opera House and Israeli-Canadian Moshe Safdie, who has built major theaters and museums in Toronto and Montreal.

Beijing hopes to achieve international recognition

This is not to say the bigwigs in Beijing have become transfixed with all things European. Insiders say the project could be given to a Chinese firm to manage, leaving open the door for the hire of foreign architects. The committee's publicized criteria emphasize the building's need to display obvious Chinese characteristics, and the winning proposal may well include a variation on the archetypically Chinese imperial yellow glazed tile roof. After all, the late great Premier Zhou Enlai insisted that yellow tiles top even the Stalinist Tiananmen Square monstrosity, the Great Hall of the People.

Symbol of the arts

Yao Bing, who is also director-general of construction for the Ministry of Construction, said recently that the design should "take first a holistic view of Tiananmen Square," both its popular essence and its role as a memorial point for the nation. But the design must cover new

territory, and not rely on the more staid edifices of the recent past. "Building a second Great Hall of the People is not right," Yao said.

As if the theater's designers did not have enough pressure, the schedule for the next six months has been decided down to the half hour. Applicants from the 40 foreign and domestic design firms chosen to bid must submit proposals by 2pm on July 13. Thirty minutes later the selection committee of 11 foreign and domestic construction and theater experts will convene. In the ensuing nine days, a technical committee will evaluate submissions based on quality of design, acoustics, stagecraft, fire prevention, and other aspects. And on August 3 the Proprietary Committee will issue a written decision naming their three shortlisted architects for final selection by the leading group. If all goes unimpeded, and official ambitions indicate it probably will, the National Theater could host Peking Opera inside four years.



Scheduling is down to the last half hour

Uncertainty surrounds Yangtze diversion Sweet water sour

In a characteristically offhand fashion during a 1952 inspection tour of the Yellow River, Mao Zedong gave rise to the planning of what, if built, would be the most ambitious water diversion project ever, the Nanshui Beidiao (South Waters North) project. "The south is rich in water and the north suffers a dearth; if possible, borrow some from the south," the Great Helmsman proclaimed.

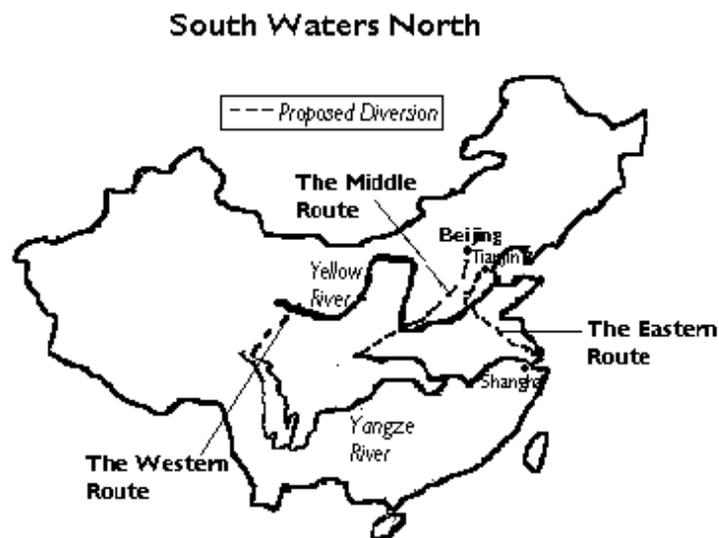
Obedient hydrologists duly formulated plans to divert water from the Yangtze, plans which ever since have been periodically heralded by officials as the answer to northern China's worsening water woes. Today, the story is much the same: some say the project must, indeed will, proceed immediately, while others claim it has been scrapped or deferred indefinitely.

The implications of "sending sweet water from afar and gleefully enjoying the Yangtze River water," as one 1978 news article described the project, are massive. Official estimates for total investment if all three parts of the project are built exceed \$20 billion. As the cost of the Three Gorges project ballooned from the original budget of \$10 billion to a final cost now estimated at between \$17 billion and \$30 billion, the Yangtze diversion could exceed even this in the annals of hydro-engineering audacity.

No-one denies that northern China is in the midst of a serious water shortage (see box, p7). The heavily silted and volatile Yellow River, the region's aorta, has been mercilessly exploited.

'The south is rich in water and the north suffers a dearth'

Water would flow from the Yangtze along three routes



Water problems are a serious obstacle to development...

Another white elephant?

In trying to ease the water shortages, the government is dealing with a management system even more intractable than the over-developed bureaucracy it is striving to reform. But as with the bureaucratic reforms announced earlier this year, there is a sense of urgency. In March the official China Daily called water-related problems “a major stumbling block to China’s sustainable economic and social development.” And Lester Brown wrote that it would require “literally restructuring the entire economy to make water more efficient.”

be a high-stake gamble that would change the face of China for centuries to come in ways impossible to predict. But the two projects are also quite different. SWN, in size and scope, is unlike any water project ever attempted. It could involve the diversion of billions of cubic meters of water over three separate stretches totaling close to 2,500 kilometers.

Building on imperial past

The most comparable predecessor was built in imperial China: the Grand Canal, extending from Beijing to Hangzhou, constructed by Sui emperors in the seventh century. Its purpose then, and when it was extended by the Mongols in the late 13th century, was economic unification of the prosperous south and the strategically important north. While the SWN project includes plans to open some stretches of canal to inland transport, the focus is not on moving rice or coal but on moving water.

...but major diversions may not provide the solution

However, it seems that some Chinese leaders fond of white elephants would rather restructure the country’s geography. As has happened before, the water shortage is being attacked with a contradictory brace of old and new solutions. On the one hand, officials are urging price reforms (see box, p9), while, on the other hand, promoting the South Waters North (SWN) project, which for some carries the promise of solving an age-old natural menace in one fell swoop, but for others threatens catastrophe.

The eastern route of SWN would expand sections of the old Grand Canal, siphoning off the Yangtze in Jiangsu province, and running the water north through Shandong’s Dongping Lake and on to Tianjin and Beijing. The route faces a major natural impediment: the elevation of the

SWN will inevitably be compared to the Three Gorges project. The SWN project would

Yangtze basin in Jiangsu is more than 40 meters below that of the Yellow River 660 kilometers to the north, requiring the use of 13 giant pumping stations along the 1,150-kilometer route.

Conversely, about 1,000 kilometers to the west gravity would draw water north from Danjiangkou reservoir. The initial stage of this middle route involves raising the Danjiangkou dam so that 15 billion cubic meters of water per year flow down a 1,245-kilometer channel to Beijing. The plan would require more than 1,500 buildings and bridges, and the major engineering challenge of crossing the Yellow River.

The third, western route, mainly through remote Qinghai province, is considerably shorter than the other two, but would involve even more complex engineering. This route would move 19.5 billion cubic meters of water per year from the Jinshajiang River in the upper reaches of the Yangtze to the Yellow River not far from its source. It would benefit poor inland regions and rejuvenate the river for its entire course, but the mountainous terrain would mean much tunneling and other expensive engineering feats.

When the Sui and Mongol emperors built the Grand Canal they simply called on imperial engineers and corvee laborers and set them digging. These days, things would be a bit more costly. Estimates for each route vary significantly. A 1992 New York Times article put the cost of the eastern route alone at close to \$10 billion, while a recent government report quoted a Shandong official's estimate of just \$900 million. The middle route, according to an article in the China Economic Times, would cost \$6.4 billion, and the most recent official estimate for all three routes is a "static investment" of \$26.4 billion.

Environmental cost

This does not include the costs of environmental impact in moving billions of cubic meters of earth, inundating several towns, and depriving the Yangtze of tens of billions of cubic meters of water a year. Official estimates say 200,000-220,000 people would have to be moved, and farmers in Hubei province would have to be compensated for losses caused by exporting water to the north. Another possible

More than 200,000 people would have to be moved

Many experts think water price reform is more urgent

Yellow River dries up

A new sorrow

Much of the time, instead of crashing triumphantly into the sea in Shandong province, the Yellow River melts into a muddy blur. In late January, Lester Brown of the Worldwatch Institute, concurring with Chinese hydrologists' long-standing predictions, wrote: "There is a very real possibility the Yellow River will become an inland river in a matter of years." In fact, his prediction was already too late: Last December an officially approved dam was constructed across the dry riverbed near the Shengli oilfield in Shandong province, preventing water from flowing into the sea (see China Agriculture Newsletter, May 1998).

Polluted by industry and dammed, diverted and siphoned for irrigation, the Yellow River carries ever less usable water

to its dependents in the North China plain. And the demise of the river only exacerbates the discrepancy in water distribution: though the area north of the Yangtze contains almost half of China's population, it contains only 19 percent of its water (see chart, p8).

The most obvious impact is on agriculture, but the dire water situation also brings huge problems for China's cities and industries. In March, Shao Yisheng, director of the China Urban Water Resources Center, predicted that by the end of the century "Many big cities, especially those in North China, will be hit by a serious water crisis." Already the per capita annual water resources of Beijing and Tianjin, at about 422 cubic meters, are only 5 percent of the world average. Water shortages cost an estimated \$27 billion per year in lost production, mostly in the north.

Pollution, damming and diversion have tamed the dragon

Some reports say South Waters North will go ahead...

problem was cited by Xie Jinrong of the Ministry of Water Resources in an interview for a report by the US embassy in Beijing in November 1997. Without simultaneous price reform, Beijing would continue to reuse only 20 percent of water, so that more water would mean more waste, Xie says, resulting in "a serious environmental problem."

In March Xinhua reported that "hydrologists are currently leaning toward the eastern route as the most desirable option." Then, in mid-April, China Economic Times reported that an official with the Yangtze River Water Resources Commission had said the feasibility study for the middle route was approved in late February, and that "priority implementation" had been agreed.

Mixed messages

Li Xiaokai, an official with the Ministry of Water Resources currently liaising with the World Bank, says "All three routes will eventually be implemented. The State Development and Planning Commission is in full support of this, so it's only a matter of time."

But the confusion continues. Wu Wei, department head of the office responsible for the middle route under the Yangtze River Water Resources Committee, says the feasibility study was passed but the plan is under review by the State Council. Asked when she expected a decision, Wu said this was "unclear."

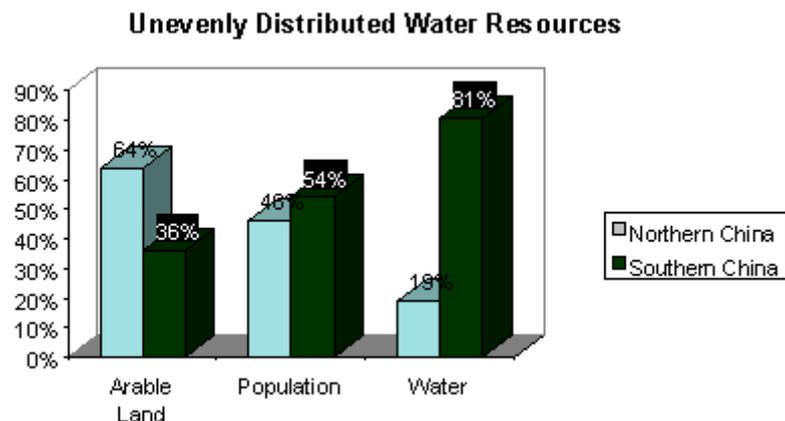
There are other signs that implementation may not be so imminent. Gu Li, a vice-department head of the Foreign Investment Office of the Ministry of Water Resources, says her ministry's SWN project office was disbanded months ago, its members reassigned. Li Xiaokai also confirms that many aspects of the diversion remain under review, largely because some experts and officials from the National People's Political Consultative Conference think the cost is too high. Even optimists agree that SWN would have to be broken down into several stages. Li estimates the cost of just the first phase of the central route would be from \$2.4 billion to \$3.6 billion, not including "contingencies."

According to the US embassy report on SWN, funding for the middle route would be split 60:40 between central government and the provinces through which the channel flows. The central government might hope to get part of its funding from the World Bank, which despite declining participation in the Three Gorges project does lend for numerous water projects in China. But Daniel Gunaratnam, a senior water official for the World Bank in China, denies the possibility of World Bank participation in the near future. "The project is not in our lending plan for the next three years," Gunaratnam says.

The question remains, is SWN in the government's plans for the next three years? Or, after the controversy surrounding the Three Gorges project, has it simply lost its nerve?

...while others say it has finally been abandoned

'Many big cities in North China will be hit by a water crisis'



**Could higher charges stem the flow?
The price of cheap water**

The central government -- and some local governments -- are showing increasing signs of recognition that rational utility prices are key to protecting natural resources, and that price reform is vital in the water sector. Such reforms are sorely needed for inefficient industrial and private water use habits. The typical cost of urban water in China is about \$0.12 per cubic meter. Even adjusted to reflect differences in per capita income, this is a pittance.

Not only home users have taken advantage of this cheap supply. A government report in 1990 said water use in steel factories in Hebei province was more than 30 times the average in developed countries, and water use in beer breweries was more than four times greater. The rest of China's industry is said to be as bad or worse.

"When setting a reasonable price for water, consideration should be given to the cost of water production, waste water treatment, and water resources protection," China Urban Water Resources Center official Shao Yisheng said recently.

More rational pricing has already shown some benefit within China. Liu Changming, a research professor with the Chinese Academy of Science, used Qingdao as an example of how pricing can work here. At \$0.20 per cubic meter, Qingdao's water prices are the most expensive

in China, and water usage there is more efficient than anywhere else in the country.

Underpriced water means not only wasteful and environmentally destructive usage patterns, it also means loss of income for water suppliers. Without sufficient returns, suppliers have neither the means nor the incentive to improve water quality and service and to implement water recycling.

But market pricing would not only save loss making state-owned water companies, it could also draw more investment from foreign water developers. "As more municipalities are freer to set higher water rates, more areas will have prospective income streams that make the projects worthy of serious consideration by investors," says Jonathan Sinton, an infrastructure expert with EHS Consultants, a subsidiary of CH2M Hill.

These investors could bring with them a great deal of experience and expertise in efficient water use. CH2M Hill, for example, advises water suppliers on how to maintain facilities that provide efficient and quality water service while keeping costs low. As one of the world's largest water engineering firms, CH2M Hill is optimistic that China will offer more opportunities. "We believe that raising water rates will stimulate foreign investment enough to make it worth our while to offer our services in China," Sinton says.

Underpriced water encourages waste

Market pricing would draw more foreign investment

**Export fall hits construction supplies sector
Materials malaise**

The twin problems of industrial reform and the Asian financial crisis have taken their toll on basic materials production, hitting cement, glass and steel plants especially hard. This is bad news for the government, which is hoping for high growth in the sector to help ease growing unemployment. Clear Thinking research indicates that hopes of any revival are premature. The first quarter's hefty losses are here to stay, at least until domestic and Asian demand picks up.

China Infrastructure News reported in March that government officials are hitching their hopes on the domestic housing market to engender a materials explosion. But most analysts predict housing to pick up in earnest next year, not in the second half of 1998. Even officials admit that housing starts will be responsible for only 0.6 percentage points of the 8 percent target GDP growth rate, hardly the lion's share. Whatever domestic construction rise does occur will never

Cement, glass and steel firms have fared badly this year

Cement exports fell 37% in the first quarter...

...but the Asian financial crisis may have worse in store

be able to absorb the 10 million tons of annual cement exports in past years.

Construction conundrum

So if housing is not going to save the sector, what will? Certainly not exports. Sectoral exports in February, the last month for which statistics are available, decreased more than 12 percent year-on-year, to just over \$250 million. The cement industry was worst affected: while first quarter production grew slightly, exports plummeted year-on-year by 37 percent. The reason was no mystery, as Southeast Asia accounts for 80 percent of cement exports.

Chinese Academy of Social Science economist Qi Jianguo predicts that the real effects of the Asian crisis have not yet hit. If he is right, sales will contract from the first quarter's 3 percent year-on-year decrease for the rest of the year. The State Administration of Building Materials Industry (SABMI) reported that sector-wide sales in the first quarter of 1998 decreased to just over \$2 billion. Slow sales helped send first-quarter losses among 3,800 state-owned materials producers to \$100 million. This after the construction materials industry experienced an annual loss for the first time ever in 1997, totaling \$120 million.

The fall in the first quarter follows slowdowns in several sectors in 1997, all of which are expected to continue until at least the fourth quarter of 1998. Glass production last year, at 168 million cases, exceeded supply by 28 million cases, leading to a price drop of 24 percent and

huge losses for large manufacturers like H-share company Luoyang Glass. Similarly, two Hong Kong-listed mainland steel firms, Chongqing Iron and Steel and Maanshan Iron and Steel, reported revenue shrinkage in 1997. Maanshan, one of the largest steel producers in China, was pessimistic about the implications of the losses, saying that in 1998 "the international steel-product markets will still face oversupply and the prices for steel products are unlikely to pick up."

For foreign firms, the effects of the slowdown have also hit hard, but most are riding it out with ambitious expansion plans. Building materials trader Arnhold Holdings has experienced slower than expected sales this year and difficulties collecting from customers. Dario Pong, the manager of a Hong Kong-owned steel factory in Wuhan, said he has turned his attention to acquiring domestic firms, since "after all, we will not make any steel exports, this year or next, until the South Koreans' prices rise." Pong, like many other foreigners with deep pockets, sees opportunities out of the chaos.

Paul Yang of Davey International, a Canadian firm with \$1.2 million annual turnover in China, welcomes the slowdown, "since our business is actually taking off." And French construction materials giant Lafarge Group announced in early May that it will open a \$145 million cement factory in Sichuan province with annual output of 1.2 billion tons, increasing its China stake to \$200 million by 2000.



Northeast anticipates Beijing rail bypass

Cutting out the capital

Rail customers in Northeast China can stop dreaming and start talking about their much-needed Beijing bypass, as the economic feasibility study nears completion for large-scale development of transport links along the Harbin-Dalian-Yantai-Shanghai corridor.

Inadequate infrastructure is one of the biggest problems facing investors in the Northeast, which has some of the worst rail bottlenecks in China. New track, rolling stock and signaling systems

are urgently required to boost economic development and transport links along the corridor. Inadequate rail links are also a major drag on development of trade with Russia and other former Soviet republics.

In terms of total length of railway track to land area, the Northeast is one of the best served areas of China. But the railways in the region, as in other parts of the country, have failed to meet the needs of a modernizing

The Northeast has some of the worst rail bottlenecks

economy. Quantity of rail freight has remained stable, and freight distribution has been a particular problem on the major routes south to central and southern china. Nationally, the railways can only satisfy 60 percent of freight demand. The Shenyang-Beijing section is one of the worst bottlenecks in the country, so the improvements to the route to Dalian will bring welcome relief.

Rail plan nears reality

The Harbin-Shanghai route will be an important part of China's planned \$29.5 billion investment in railway construction over the next five years. Planned spending for this year has been increased to \$5.4 billion, from the \$4.2 billion originally proposed. The government is desperate for infrastructure spending to push growth above the disappointing 7.2 percent in the first quarter, and to provide jobs for redundant workers.

Development of the corridor should open up some major contracts to foreign bidders for further electrification, new track, upgrading, and rolling stock improvement. German firms will be favorites to benefit, as the second-stage feasibility study was commissioned by MOFTEC, the Ministry of Railways and the German Kreditanstalt fuer Wiederaufbau (KfW), which also provides soft loans for German companies, and the study has been undertaken by a largely German consortium. The consortium is led by GOPA consultants plus one Swiss and four German partners. Established in Germany in 1965, GOPA has provided consultancy in more than 130 countries, focusing on transport planning, management, economics, environment and energy.

A technical feasibility study has already been carried out by the Ministry of Railways and officials working on the project say they are confident of approval of the economic feasibility study, due to be completed by the end of next month. The study will examine rail infrastructure and services, ferry and shipping services, and road traffic. The route from Harbin to Shanghai will bypass Beijing and probably Tianjin, most likely by making use of a rail ferry link from Dalian to Yantai. Other options, which could be used instead of but more likely in combination with enhanced rail ferry links, are road ferry links between Dalian and Yantai, coastal

shipping, and improved rail links around the Bohai Bay.

Preparatory work for the electrification of the Harbin to Dalian line began in 1993. It was scheduled to be completed in 1996, but is unlikely to be completed until the end of this year. Electrification is the main focus of the study for the Harbin to Dalian section of the corridor, and looks certain to proceed. The Ministry of Railways estimates the total cost of additional improvements to the Harbin-Dalian line at \$200 million. Electrification is scheduled for completion in 2000.

The ports of Dalian and Yantai could gain most from the new projects. Currently, rail freight from Dalian sets off north to Shenyang, before heading south again via Beijing to the rest of the country. The successful expansion of Dayaowan, Dalian's new port, which opened in 1992 and is still under development, depends on better rail links. Dayaowan has space for 80 berths long its waterfront, with a potential annual handling capacity of 100 million metric tons.

Once the feasibility study for the Harbin-Dalian-Yantai-Shanghai corridor is approved, the next step will be to secure central approval to use soft loans, which look certain to feature in most supply contracts. With its strong base in Northeast China, ADtranz, jointly owned by Swiss-Swedish engineering group ABB Asea Brown Boveri and Germany's Daimler-Benz, is expected to be a leading bidder. ADtranz has so far been mainly involved in supply and construction of rolling stock for mass transit systems, notably the Shanghai and Guangzhou metro lines. Its success has been helped by the German government's willingness to provide concessionary financing packages. When ADtranz secured the right to supply Guangzhou Line 1, the German government came up with a \$192 million soft loan. ADtranz will also have a big advantage over rival bidders on the Harbin-Shanghai line as it has backed up its stated commitment to becoming a local supplier of rail equipment by setting up China's first joint venture for rolling stock, ADtranz Changchun Railway Co. ADtranz's first joint venture in China was formed in March 1996 with the Shenyang Railway Signal Factory, to produce signaling and traffic management systems.

The Harbin-Shanghai corridor will bring major contracts

Dalian and Yantai could benefit most

ADtranz will have a big advantage over rival bidders



Everbright clinches road contract

China Everbright will invest \$170 in two infrastructure projects in Fuzhou, the capital of Fujian province. China Everbright will be the sole investor in the Qingjiang Bridge and the connected Changle Airport Expressway. The bridge spans about 2,200 meters and the expressway covers 18.5 kilometers. Construction is scheduled to start this month and the bridge should open to traffic in 2000. The rate of return is likely to be more than 15 percent. China plans to invest \$19.3 billion in road construction in 1998. With a total length of 24,500 kilometers, the 129 road projects planned for this year will increase China's total road length to 1.25 million kilometers.

Westinghouse supplies generators

US-based Westinghouse Electric has won a \$167 million contract for the supply of power generating units for the first phase of the Yuzhou thermal power plant in Henan province, after a two-year international bidding process. Westinghouse will be responsible for providing the turbine and boiler island for the two 350,000-kilowatt units at the plant. The Harbin Boiler Works in Heilongjiang province will be the sub-contractor to produce the boilers and subsidiary equipment for the project. Yuzhou thermal power plant is a key project with a total investment of \$300 million, of which \$200 million has been loaned by the Asian Development Bank. After its completion by 2000, the plant will help ease the energy bottleneck in southern Henan.

Wuhan treats waste water

The notoriously dirty capital city of Hubei province has been granted a World Bank loan to treat waste water. The project, which will cost \$168.67 million, including \$5.63 million from the World Bank, is part of a major effort to clean up the image of Wuhan and turn it into a "modern garden city." The investment will be used to build five wastewater treatment plants, seven pumping stations and 100 kilometers of

pipeline. The project is expected to be completed by 2002.

Yen loans finance power plant

Shaanxi Hancheng No 2 Power has received a \$269 million yen loan from the Export and Import Bank of China (Eximbank). The loan, part of the fourth batch of Japanese government loans dispensed last year, will be used to construct a power plant designed to alleviate power shortages in Northwest China. The power plant, expected to be completed by 2003, will use two coal-fired generating units with a capacity of 600,000 kilowatts each. Besides the Hancheng power plant, the 1997 yen loans will be channeled into 13 other projects including the Pudong International Airport, the Shanxi Wangqu Power Station, and pollution control for the Xiangjiang River in Hunan province and the Huaihe River in Jiangsu province.

US-Japan energy deal

Foster Wheeler (USA), Hitachi (Japan) and Itochu have won a contract for a coal-fired power plant project in Jiujiang, Jiangxi province. The US engineering company will supply boilers for two 350,000-kilowatt capacity generators, while Hitachi, Japan's largest electric machinery maker will supply the turbine generators. The government hopes the first plant will start operating in 2001 and the second in 2002, in the third stage of the project financed by Japan's overseas economic cooperation fund.

Railway to link Daya Bay

A railway linking Daya Bay in Guangdong province to the national railway network will begin before the end of this year. Hong Kong investors and the Huizhou municipal government are constructing the 51-kilometer Huizhou-Aotou railway at a cost of \$96 million. The railway is expected to come into operation within three years. It should boost the development of the Daya Bay area, the location of the Daya Bay Nuclear Power Station, and the biggest Sino-foreign joint venture, China Offshore Oil and Shell's Nanhai Refinery.



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