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CHINA INFRASTRUCTURE:

Sectoral Plans, Reforms and Financing

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DEPARTMENT OF FOREIGN AFFAIRS AND TRADE
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Part 1

SECTORAL OUTLOOKS

China's investment in infrastructure has not kept pace with demand. Physical infrastructure has expanded only 7 to 8 per cent per year on average over the past decade, while infrastructure utilisation has soared 13 to 14 per cent per year.[1] As a result, facilities are stretched to the limit. The worst shortfalls are in transport and power, with broad flow-on effects. The least affected areas are civil aviation and telecommunications, which are growing quickly (East Asia Analytical Unit, 1997).[2]

This briefing paper examines how China is addressing constraints in the transport, telecommunications and power sectors under the Ninth Five-Year Plan. It also looks at how China is financing its infrastructure programmes, including the role of Australia's international development assistance bureau, AusAID.

The Ninth Five-Year Plan

Following years of neglect, China has improved its aggregate level of investment in infrastructure to around 6.5 per cent of GDP, well above the developing country average of 4 per cent and close to the World Bank's recommended level of 7 per cent. Under the Ninth Five-Year Plan (1996-2000), China plans to invest US$300 billion in infrastructure development, with $45 billion projected to come from foreign sources (via commercial loans and foreign direct investment).

The Ninth Five-Year Plan (Table 1) has four underlying criteria relevant to infrastructure:

1. It further separates public fixed capital investment from general investment and prioritises projects into three categories: competitive sector (state enterprises), economic foundation (infrastructure) and social welfare (schools, hospitals). It also, for the first time, has an explicit focus on quality rather than quantity.

2. It recognises the need to address the growing disparity between the booming coastal provinces and poorer inland areas. The Ninth Five-Year Plan expects to achieve this through incentives to attract foreign investors rather than by huge central budget allocations. Increased focus on inland regions may affect adversely enterprises struggling with overstretched infrastructure in the coastal provinces.

3. It gives high priority to the environment.

4. It has a specific focus on national electric power development.

Will the Plan Be Achieved?

In the past, high-priority projects benefitted from preferential budget allocations and extrabudgetary financial resources (approximately 10-15% of state investment consisted of these 'key state projects'). However, dwindling state revenues, weak financial institutions, shifting priorities and the ambitious size of many projects are factors that, combined, give rise to serious concerns over the Ninth Five-Year Plan's achievability. With the exception of telecommunications and aviation, most infrastructure investment has not achieved even previous Plans' targets (especially the planned additions to rail and road freight capacity).

[1] Officially, GDP growth has averaged 9 per cent per year during the same period, but estimates done for this report are closer to 8 per cent.

[2] Transport bottlenecks alone delete one percentage point per year from GDP expansion (International Market Assessment/Economist Intelligence Unit, 1996).

Table 1
Power and Communications Are Top Priorities
Infrastructure Development Under the Ninth Five-Year Plan
(1996-2000)

Sector	Capacity to be added over 1995 (1996-2000)	Estimated total capacity by 2000	Planned per cent increase over 1995	Estimated total investment (US$ billion)
Aviation				
-Passenger traffic (million)	55	100	122	20[a]
-Air freight traffic (million tonnes)	0.9	1.8	100	
Ports and waterways				
-Shipping traffic (billion ton-km)	595	2300	35	8
Railways (km)	10 000	70 000	17	42
Roads (km)	130 000	1 247 800	12	38
Telecommunication				
-Exchange lines (million)	70	140	100	60
Power				
- Total installed capacity (gw)	90	300	43	64[b]
- Nuclear power (gw)	17.9	20	852	
Coal				
-Production (million tonnes)	230	1500	18	24
Oil				
-Production (million tonnes)	36	185	24	
-Oil refining (million bpd)	0.9	4.6	24	49[c]
Gas				
-Production (billion m^3)	2.6	20	15	
TOTAL CAPITAL INVESTMENT				**305**

Note:
a. Includes US$16.3 billion for aircraft and US$3.4 billion for airports.
b. Half of this capital budget is to go to transmission lines.
c. Includes US$38.5 billion for oil and gas exploration and US$10.4 billion for oil refining.
Sources: *China Economic News*; EIU, 1995: *Infrastructure in China*; EIU, 1996: *China Hand*; International Market Assessment/EIU Australia research.

As a result, the Ninth Five-Year Plan's targets may not be realised until well into the Tenth - or even a later - Plan period. However, on a positive note, over the long term stronger coordination and more consistent planning are expected to evolve in line with more realistic attitudes and greater regional interdependence. This is starting to be observed in Shanghai, for example, as it seeks to realise its vision of becoming a major Asian financial and economic centre in the twenty-first century.

It should also be noted that while wasteful, misguided and inefficient allocation of resources occurs, China *does* have a capacity to direct resources to important areas in an effective manner. Ultimately this can provide many beneficial opportunities for companies.

Aviation

Air passenger and cargo demand has expanded more than 20 per cent per year over the past decade, while air routes have increased 15 per cent per year to more than one million kilometres.[1] With mainland international and domestic traffic projected to soar nearly five-fold from 61.6 million to 292 million passengers between 1995 and 2010 (*South China Morning Post International Weekly*, 19 July 1997), China is under strong pressure to improve air traffic control, pilot training, passenger and freight processing, airport management and other services.

Plans

Because civil aviation has developed rapidly over the past decade, it has ceased to be a priority sector under the Ninth Five-Year Plan. Attention will go to aircraft purchases and upgrading air traffic control systems, aircraft maintenance, aviation safety and quality of airline services. Plans exist to enlarge existing terminal capacity and to build additional provincial airports. According to Reuters (February 1996), 60 new airports will be built and 30 will be upgraded. In 1997 alone, China has earmarked US$2.2 billion for aviation infrastructure, including eight new airports. This is double the amount spent in 1996.

Administration

The Civil Aviation Administration of China (CAAC) in the past acted as regulator, administrator and operator of air services, and was responsible for aircraft factories. As the aviation industry is progressively reorganised and decentralised, the CAAC is becoming primarily a regulatory authority. It does, however, still have the following functions:

- plans overall aviation development
- plans most major civil airports
- administers air routes
- approves airport construction.

Municipal governments are responsible for the construction and administration of airports.

Reform

Civil aviation was decentralised in 1987, when the CAAC's flight operations were split into six regional carriers: Air China (international routes), China Southern, China Eastern, China Southwest, China Northwest and China Northern. The first three have a combined 58 per cent share of commercial traffic. Demand was such that provincial and municipal authorities began to establish their own airlines, such as Shanghai Airlines and Sichuan Airlines. By 1993, 12 new major airlines had emerged, and CAAC froze further approvals. However, with demand spiralling and many Chinese airlines unable to afford to upgrade equipment and services, the CAAC is expected to release a five-year plan encouraging regional airlines to establish joint ventures with foreign investors, who may own up to 35 per cent. Hainan Airlines was the first to take on a foreign investor: American Aviation Investment in 1995. China Eastern Airlines issued shares to foreign investors in early 1997, and China Northwest and China General Purpose Aviation, which specialises in flights for agriculture, industry and emergency services, may follow suit. The main opportunities for foreign firms, however, may be in the burgeoning aviation services field.

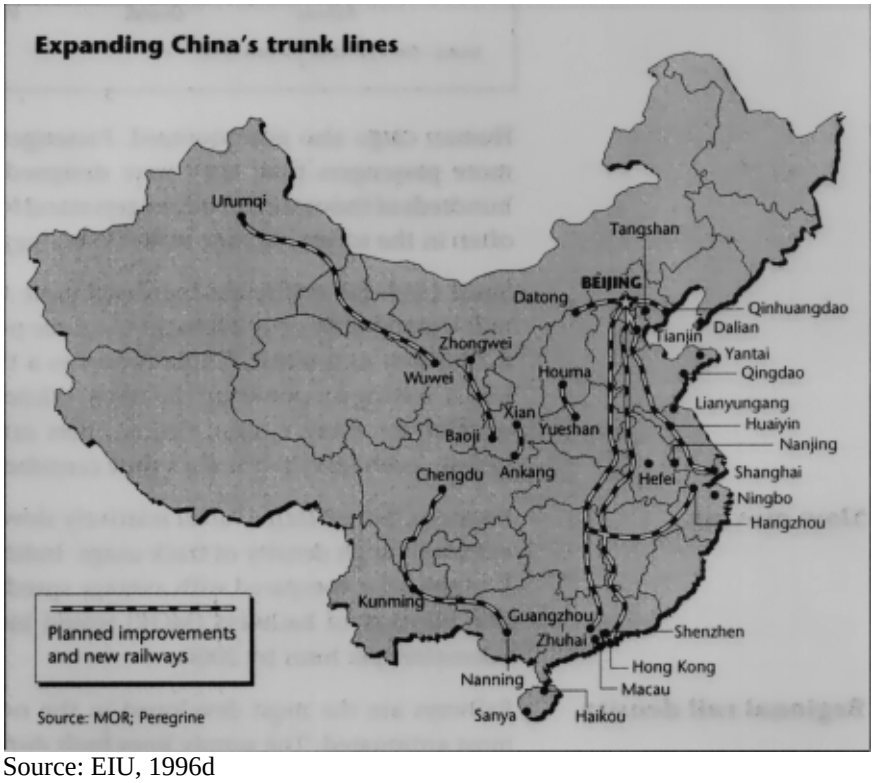
[1] Air passenger traffic topped 65 million in 1996, while air freight turnover exceeded 3 billion metric tonne km. As at October 1996, China had 129 commercial airports (up from 98 in 1993), over a third of which offered direct flights to Hong Kong. Of the 129, 14 can accommodate Boeing 747s and 81 can service 737s; the remainder handle mainly small aircraft

Rail

The rail system is national in scope, linking all provinces but Tibet and carrying 53 per cent of passengers (1.02 billion in 1995) and 70 per cent of freight (1.66 billion metric tonnes in 1995, with coal comprising about half). North and northeastern China have the most railways, reflecting these areas' concentration of core state-owned industries. The fast growing provinces to the south increasingly rely on roads.

Despite national coverage, in 1994 China had only 40 per cent more operating railways (53 992 km in total) than in 1950, less than the USA in 1865 (56 315 km) and India in 1913 (55 762 km), both countries with a comparable land area. However, China now recognises rail as the backbone of its transport system and is devoting considerable effort to building and upgrading lines. The new Beijing-Kowloon railway is expected to greatly assist economic development in central China, linking such key provinces as Henan, Hubei and Jiangxi which have not participated in China's coastal development strategy. A handful of smaller lines have also been completed, including the Fuzhou-Wenzhou line linking Fujian and Zhejiang provinces (started up in August 1996).

With demand (particularly on the highly congested north-south routes) far exceeding capacity and the average speed just 30 kph, the bottlenecks will not be resolved soon. Estimated daily freight demand tops 120 000 cars, but existing capacity can meet only 60 per cent of this. Daily passenger demand averages about 2.8 million (and 3.8 million during festival periods); capacity is 2.5 million people (International Market Assessment/EIU Australia, 1996). As a result, the system is choked, with millions of tonnes of minerals, produce and goods piled up awaiting transportation. Rail services from Guangzhou to Shanghai often require 30 days' prebooking, and the actual journey can take 20 days due to delays in loading and unloading along the route. Rail transport is further complicated by huge seasonal movements of grain, which take priority, and by the importance of *guanxi*, or connections, in securing bookings.



Source: EIU, 1996d

Plans

Over the past decade, the main focus of railway development has been to electrify the existing network, rather than to increase capacity. Despite major bottlenecks, the Ninth Five-Year Plan projects only modest rail expansion. By 2000, railways are projected to extend 70 000 km, one third of which will be double-tracked

The priorities are to:

- extend south-west lines
- improve north-south lines
- strengthen north-east lines
- extend north-west lines
- focus on new high-capacity trunk and regional lines
- build more coalers
- develop higher-speed, heavy-duty passenger and cargo trains.

Administration

The Ministry of Railways oversees the building of railway lines, the manufacture of locomotives, rolling stock and equipment and rail-related imports, and the administration of overall railway operations. It has 12 regional railway administrations, 19 construction bureaux, five survey and design institutes, 68 factories and 11 training colleges (Economist Intelligence Unit [EIU], 1996d).

Reform

The railway system is probably the least reformed of China's infrastructure sectors. Still centrally administered, it employs over 2.2 million people and owns and operates a vast range of affiliated organisations, including factories, training institutes, schools and hospitals. Some rail links are locally owned and operated. In recent years, the Ministry of Railways has formed more than 20 joint ventures with local governments under corporatisation schemes. Further trials decentralising ownership and operation are underway (see box).

Railways may be broken up into regional operating companies, along the lines of the civil aviation sector, but this kind of reform is not imminent due to the system's enormity and diversified interests. "It's not just an industry; it's a community," explained a high-level Rail Ministry official.

Guangzhou Railway Group

Established in February 1993, the Guangzhou Railway Group (Guangtie) was China's first railway enterprise, with assets of 12 billion yuan and 172 000 employees. The Group is seen as an important step in China's move from a highly centralised and planned economy to a more market-oriented system. It reports to the Ministry of Railways but operates as an independent economic entity with its own legal status and responsibility for its own profits and losses.

Guangzhou Railway Group is responsible for approximately 4000 km of tracks, including 3000 km of state-owned railways in Guangdong, Hainan and Hunan, 873 electric and diesel locomotives, and 2423 passenger cars, 24 per cent of which are air conditioned. In 1994, the Group dispatched 98 million passengers, moved 88 million tonnes of goods and invested 4 billion yuan in railway construction projects. Its business interests are diverse, including project construction, industrial processing, research and development, commerce and trade, tourism and real estate.

Guangzhou Railway Group's management and financial system focuses on increased efficiency and productivity, particularly faster railway line construction. It keeps all revenue from freight turnover and railway construction funds from state tariffs and transport profit quotas. It has more flexibility than many other enterprises on pricing, labour, financing and diversifying into other businesses. Its Guangzhou-Shenzhen railway company, for example, was allowed to charge a 50 per cent premium on the standard fare to the end of 1995. It has applied for an extension of such autonomy. The Guangzhou-Shenzhen railway company is also the first to raise funds through share issues, appointing US investment bank Bear Stearns to handle its float of H shares on the Hong Kong stock exchange.

Source: EIU Australia

Roads

China averages 1.1 km of roads per 100 km^2 (versus 7 km/100 km^2 in the USA and 4.7 km/100 km^2 in India). Even the better developed coastal areas have only 2.5 km/100 km^2. The problem goes beyond shortages. Of 1.1 million km of roads, only 8500 km are modern highways. Only 23 per cent are asphalt paved and most have poor durability. A fifth of China's roads are unusable in wet weather. (EIU, 1996b). With the number of vehicles projected to at least quadruple by 2010, pressures are building rapidly.[2]

Source: EIU, 1995

Plans

The Five-Year Plan emphasises interregional roads to link heavy traffic areas. Bridges across the Yangtze and Yellow Rivers and roads in central and western China have high priority. Roads for national and border defence, and improved roadworks at frontier posts are also mentioned. By 1996, 2100 km of quality highways had been built, mainly in coastal regions, including Beijing-Tianjin-Tangshan and Guangzhou-Shenzhen, and on two important hinterland routes, Xian-Bingmayong and Chengdu-Chongqing. The new Shanghai-Nanjing superhighway should benefit east China as much as the Guangzhou-Shenzhen highway has south China.

The National Trunk Highway System, a 30-year highway development programme dating from the Eighth Five-Year Plan, includes seven priority projects (EIU, 1996d):

1. Tongjiang, Heilongjiang to Sanya, Hainan (5200 km)
2. Beijing to Zhuhai, Guangdong (2400 km)
3. Harbin-Dalian-Yantai-Qingdao-Lianyungang, connecting Heilongjiang, Liaoning, Shandong and Jiangsu to Korgas, Xinjiang (4400 km)

[2] In 1995, China produced 1.45 million motor vehicles (the eleventh highest production globally) and 7.83 million motorcycles (the world's highest output). In 1996, there were 10.5 million automobiles, 18 million motorcycles and nearly 10

4. Shanghai to Chengdu, Sichuan (2500 km)
5. Beijing to Shenyang, Liaoning (700 km)
6. Beijing to Shanghai (1350 km)
7. Chengdu to Zhanjiang, Guangdong (1250 km).

Three major inland highways, Xian-Baoji, Changsha-Xiangtan, and Wuhan-Yichang, are also planned. The last route will be phased in to handle Yangtze River transport lost as the Three Gorges Dam is built. However, roadworks will need consistently high priority to achieve objectives.

Administration

In general, the Ministry of Communications (MOCOM) plays a planning and a coordinating role, with most highway construction and development left to the provinces, although MOCOM has its own construction and contracting companies. One of MOCOM's major projects is the National Trunk Highway System. MOCOM subsidiary departments in each province coordinate road construction and development. Its scientific research institute in Beijing and its three national survey and design institutes work on planning.

Reform

Provincial and local governments are keen to build local toll roads to generate revenue, but some see less merit in contributing to the National Highway effort, as the benefits would have to be shared. While the central Government would like to attract foreign companies to build some of the longer-distance highways as toll roads, construction costs far exceed any toll that users would be willing to pay, making such projects unviable. Toll rates are centrally administered, and generally amount to 5-10 yuan (A$0.80-1.60) per trip. Some intercity toll roads already exist, such as between Beijing and Shijiazhuang, and charge higher rates.

MOCOM is considering creating national road construction conglomerates and eventually allowing international competitive bidding for projects financed by foreign loans. The Government is hoping to secure at least US$5 billion in foreign direct investment to support its road building plans. At present, foreign companies can operate toll roads on a joint venture or BOT basis (see box). Some local authorities are now selling toll roads (mainly to Hong Kong investors) because they cannot afford to maintain them and have no reliable system to track toll collection. The Shenzhen-Guangzhou showpiece expressway built by Gordon Wu's Hopewell (Hong Kong) is not achieving expected returns because truck operators still generally prefer a longer trip to paying tolls.

Ports

For centuries, boats and ships have played an important role in transporting goods and people in China. Rivers have long served east-west routes, while canals and coastal shipping have provided north-south links. China's key ocean ports are in the Special Economic Zones and 'open cities' established in the 1980s. Inland waterways are concentrated in coastal and southern provinces, mainly Jiangsu, Zhejiang and Guangdong.[3] China has 124 recognised seaports, including 40 deep-water berths and 52 container-ready ports.

Burgeoning international trade and rapidly expanding coastal shipping (as an alternative to congested roads and railways) have severely strained China's port infrastructure. The main bottlenecks are a shortage of deep-water ports, inadequate transport links, handling facilities and capacity at both inland and coastal ports, undeveloped (or undredged) river routes and obsolete fleets.

[3] These three provinces have the most comprehensive transport networks, an advantage in both sourcing inputs and moving

BOT Investment and Development Corporation

The BOT Investment and Development Corporation was established in November 1993 to develop and invest in infrastructure projects. It manages China's build-own-transfer programme for securing international private sector investment in infrastructure projects. While it can develop roads, bridges, water supply and power facilities, the BOT Corporation is currently focusing on:

- roads (mostly 30 to 80 km segments, especially toll roads)
- power facilities (stations ranging from 24 kilowatts to 1200 megawatts).

MOFTEC and other ministries are drafting appropriate BOT-related regulations; these are to be enacted during 1997.

Believing that a small government investment stake not only acts as a catalyst, but also helps to build confidence in projects involving huge costs and long concessions, BOT Corporation takes an equity share in the projects it facilitates, for example:

- AIG and another developer are the major investors while BOT Corporation has 5 per cent in the Jintung Expressway from Beijing to Tongxian.
- Asia Infrastructure Fund and BOT Corporation have set up a road holding company for six sections of roads in Guangdong and Sichuan.

Stages of the project proposal approval process

1. BOT Corporation receives a project proposal from a local government
2. BOT Corporation evaluates the proposal
3. If more than US$30 million, it submits the proposal to the State Planning Commission for approval
4. If less than US$30 million, it submits the proposal to the provincial government for approval
   - In practice, BOT Corporation tries to keep most proposals to less than US$30 million, since the State Planning Commission approvals process can be quite lengthy
   - Sometimes, it tries to get a project approved by inserting it in a local government five-year plan, which is submitted to the central Government for approval.

To enhance relations and coordination with local authorities, BOT Corporation has established subsidiaries in regional areas, primarily joint ventures with local Planning Commissions.

Contact: BOT Corp, 8th floor, Yuquan Mansion, Yuquan Road, Beijing 100039
Tel: 86-10-6828-4525; Fax: 86-10-6828-4536

Source: EAAU interview, April 1996

Plans

The Five-Year Plan aims to expand the throughput capacity of coastal ports to 1 billion tonnes per year by 2000 (from 730 million tonnes in 1994) by adding 200 new berths and supporting facilities. With coal accounting for nearly one third of freight movement, specialised coal handling ports are a priority. Another is increased container capacity. Improved transport trunk routes are also targeted to facilitate the loading, unloading and inland delivery of coal, oil, LNG and iron ore, and containerised freight. Major projects include:

- the fourth-phase of the Qinhuangdao coal wharf
- the first-phases of Tianjin's and Huanghua's coal wharves
- coal transit-distribution bases in eastern and southern China
- container wharves in Dalian, Tianjin, Qingdao, Shanghai and Ningbo
- dredging works on the deep-water channels of the Yangtze and Pearl River estuaries.

Administration

Most ports are under the dual management of the relevant municipality and the local Ministry of Communications (MOCOM) bureau. MOCOM administers directly very large ports. Its Waterway Transportation Administration Bureau is jointly responsible for port development and administration, with the relevant municipal port administration and sometimes with the help of the provincial Communications Department.

Reform

Since the end of 1995, the regulatory and operational functions of ports have been separated to encourage commercial operation. Port charges continue to be centrally controlled. According to the Ministry of Communications, ports at strategic locations are profit-making businesses (for example, Shenzhen Port, owned by Asia Infrastructure Fund, which has numerous institutional investors with Gordon Wu as chairman). Hutchison Port Holdings, a subsidiary of Hong Kong's Hutchison Whampoa, manages container terminals at various Chinese ports in mostly majority joint ventures with local companies. It is also involved in running the ports of Shanghai, Yantian, Zhutai, Shantou, Ziamen, Jaingmen and Nanhai (the last two on the Pearl River). However, since 1995, foreign investment in port ventures is restricted to 49 per cent (previously 70 per cent).

Ports are the most decentralised of the infrastructure sectors. Increasingly, each project is being treated as a separate entity with independent management, funding and operational capabilities. Although there may be a direct reporting relationship to or direct involvement by a ministry, a complex shareholding is more likely, combining state-controlled shore-based companies (such as a transport firm) and sea-based enterprises.

Inland Waterways

Plans

Priorities for inland waterways include developing:

- new and upgraded facilities
- upgraded navigation systems
- new projects on the Yangtze and Xihu (Westlake) Rivers
- the Beijing-Hangzhou Canal (The Grand Canal)
- other major water transport channels
- water transport networks in the Yangtze and Pearl River Deltas
- better standard water craft
- mechanised loading and unloading facilities
- improved management.

Source: EIU, 1996b.

Administration

Inland waterways are administered by the Ministry of Communications and the Ministry of Water Resources. Shipping has been corporatised, with MOCOM playing a regulatory rather than an operating role.

Reform

The national inland water transport system has been identified as one means of relieving pressure on the overburdened road and rail systems. The centrepiece of planned investments is the proposed renovation and reopening of the Grand Canal linking Beijing with the Yangtze River Delta. Although such plans are still at the feasibility study stage, the total cost of the Grand Canal is estimated at 34.5 billion yuan, about 5 billion yuan less than the Beijing-Kowloon railway project.

Telecommunications

Telecommunications is one of China's most rapidly expanding sectors, with public investment exceeding 1 per cent of GDP per year. It is also one of the more lucrative investments, providing high returns to local governments. Telephone diffusion has increased dramatically, from 0.73 lines per 100 people in 1991 to 5.5 per 100 in 1996, or 62 million installed phones.[4] The goal is 10.5 lines per 100 people by 2000, but even with this, waiting lists will still be long.

Mobile phone use is soaring, with more than 6.6 million users at September 1996 and increasing cellular coverage of provincial areas. In addition to being a popular status symbol, mobile phones allow those who can afford them to circumvent the 6 to 12-month queue for a telephone connection. However, local mobile phone service providers often overcommit their capacity, negating this advantage.

Data communications services are also growing rapidly, with annual PC sales expected to rise from 1 million in 1995 to 8 million in 2000 (most go to companies). Despite restricted access, about 12 per cent of data services subscribers are connected to the Internet (EIU, 1996b, October). As telephone and computer diffusion grows, demand for electronic communications is expected to expand exponentially.

Plans

Telecommunications have developed rapidly, but have not kept up with spiralling demand. The Ninth Five-Year Plan aims to form a nationwide telecommunications network with optical fibre and digital microwave links. The goal for 2000 is 210 000 km of long-distance optical fibre links and six million long-distance automatic switchboard circuits. The central Government will fund the construction of international communications gateways and interprovincial trunk lines. Local investment will fund provincial trunk lines and city telephone systems. Foreign firms are restricted to providing equipment, technology and expertise. However, pressure is growing to open up the telecommunications services sector.

Administration

The Ministry of Posts and Telecommunications (MPT) oversees telecommunications. This administration is reflected at the provincial level by Posts and Telecommunications Authorities (PTAs) and at the local level by Posts and Telecommunications Bureaux. Services are highly localised, and the PTAs are closely involved with local authorities. The provinces fund over half of equipment purchases through the PTAs, and the MPT's funding of PTA investment (from both budgetary and self-raised sources) is now only about 10 per cent. Guangdong's and Shanghai's PTAs account for at least 50 per cent of all investment in telecommunications across China. PTAs have considerable leeway to deal with foreign firms and foreign-invested enterprises, provided suppliers are MPT-approved. They are subject to Ministry of Foreign Trade and Economic Cooperation (MOFTEC) direction.

Reform

The provision of telecommunications services has undergone significant structural change in recent years. In 1994, 26 SOEs, the Ministry of Electronics Industry (MEI) and China International Trust and Investment Corporation (CITIC) jointly established Ji Tong Communications, which has concentrated on local radio paging services. Ji Tong then linked up with the Ministry of Railways and the Ministry of Electric Power (now the Ministry of Power Industry), both very large national communications operators in their own right, to establish Lian Tong (China United Communications Corporation) as a second telecommunications carrier. Lian Tong competes with the MPT, focusing on fixed-line networks. Relying on the existing networks of the Ministry of Railways and the Ministry of Power Industry, Lian Tong has State Council approval to develop long-distance services and possibly to compete with MPT in local services as well. Although other public sector organisations with substantial national telecommunications networks want to be public carriers, nothing indicates that additional groups will be permitted to do so.

Telecommunications services are a strong cash generator for operators and local government. While local call charges are low and are subject to MPT price controls, connection charges to consumers are high enough to largely cover the fixed investment. The cash flow from calls quickly returns a profit, even at low utilisation levels. As waiting lists dwindle over the next few years and mobile/wireless options proliferate, users are expected to resist high connection fees, leading to price reform.

[4] The diffusion rate is much higher in urban areas: 17 per 100 people on average. In Shanghai, more than half of households

Power

Electricity generating capacity has doubled to 217 000 megawatts over the past decade (Table 2), making China the world's fourth largest electricity producer after the United States, Russia and Japan. Capacity is expected to double again over the next 10 years. The main problem is inefficient distribution, due to the lack of a national transmission system. According to the World Bank (1994), 16 to 20 per cent of total power (and as much as 33 per cent in rural areas) is lost due to the inefficient grid. Inadequate supply creates frequent power outages, particularly in the booming southern and eastern provinces.

Plans

Electric power is the top priority under the Ninth Five-Year Plan. Without significantly expanding generating and transmission capacity, China will suffer acute shortages that could considerably slow economic growth. Under the plan, funds are to be divided equally between power stations and new transmission lines.

Table 2

Electric Power Forecast

	1990	1995	2000
Electricity output (terawatt hours: twh)	621	965	1560
Installed capacity (gigawatts: gw)	138	217	290-300
Average annual additional capacity (gw)	15	16-17	

Sources: Ministry of Power Industry; State Planning Commission Investment Research Institute, 1994; EIU, 1996b.

Thermal power is the backbone of China's energy system, providing 75 per cent of requirements. However, the Government has been forced to consider alternatives to overcome the energy shortages resulting from coal transport problems and declining onshore oil output. One of these is massive investment in eight new nuclear power plants. Another is hydroelectric power (see Three Gorges box). In addition, China has decided to import more liquefied natural gas (LNG) as a relatively cheap alternative fuel for the power industry. Several oil majors are considering investments in LNG power plants; one feasibility study indicated that a 5000 mw per year plant would cost US$3 billion and would consume 6 million tonnes of LNG per year. However, infrastructure to support LNG imports will be expensive, as suitable port unloading and distribution facilities must be built. China also plans to construct several gas pipelines from Central Asia and Siberia.

Another alternative is the 'mine-mouth' strategy. Under the Ninth Five-Year Plan, mine-mouth plants are expected to generate 27 gigawatts of power by 2000. In 1996, 40 per cent of power stations were within 50 kms of a coal mine, mostly very small, and owned and operated by the Ministry of Coal Industry (MCI). Because these cannot connect to the national grid, much of the capacity remains underutilised. The first large mine-mouth project was awarded to a Siemens-Foster Wheeler Energy joint venture in 1996, to design and equip China's largest (US$2 billion, 2100 mw) coal-fired power plant at a mine site in Shanxi. The electricity produced by the plant will be transmitted along a 740 km high-voltage line to the coastal province of Jiangsu. However, continuing rivalry between the Ministry of Power Industry (MPI) and MCI over who will build and operate mine-mouth power stations could derail other similar projects.

Administration

The MPI (formerly Ministry of Electric Power) plans, develops and administers the electric power sector, including generation, transmission and distribution of thermal and hydroelectric power. However, the MPI does not directly operate power stations. That is the responsibility of 15 regional power networks and grids, controlled by MPI. Five of these are interprovincial networks, each supported by an interprovincial administration. The other 10 are provincial grids, the largest in Shandong and Guangdong. Under these are many local power companies and bureaux. Local and small projects, up to about 300 megawatts, can be approved locally, but MPI approval must be secured if projects are to be connected to a grid serving a wider area. Capital funding is the responsibility of the provincial Electric Power Bureaux.

The MPI is to be dissolved in 1997 under moves to separate the function of enterprise from government. MPI's functions are to go to the China Federation of Power Enterprises, state commissions and a national power corporation. The national power corporation will supervise nationwide electricity transmission. Another large company will be established to form a national power network integrating regional and provincial grids, with the Three Gorges Dam project as the hub. Regional and provincial power administrations are to be restructured under similar measures. (*Energy Online,* 25 June 1996).

Reform

The power sector has undergone extensive reform since the reorganisation of central government energy administration in 1993. Although many local power providers in the booming coastal provinces make good returns, power pricing remains a problem. The current pricing system is very complex and cumbersome. The central Government sets a range of electricity prices based on different categories of usage. Rising coal costs plus local government surcharges combine to make energy very expensive to industrial end users, especially in high-consumption zones such as Shanghai and Guangzhou.

A comprehensive law governing the control of power supply, distribution and pricing was announced in April 1996 and took full effect from September 1996. This law took more than 10 years to enact and is supposed to protect the respective interests of power plants, government transmission grids, foreign investors and consumers. The current Five-Year Plan foresees additional regulations on power supply, consumption and electricity prices.

BOT Power Projects

Not long after awarding its first build-operate-transfer (BOT) power project - Laibin B - to British/French-owned GEC Alsthom, China opened a second BOT project to international bidding - a US$700 million complex, also in Hunan province. Ten companies from the US, UK and Japan have been shortlisted.

Source: Sino Securities International Limited, 1997.

Other Energy

Coal

Coal provides 75 per cent of China's primary energy needs. This may rise to as much as 90 per cent in coming years (World Bank, 1996). China's coal industry is labour intensive, operates at a low level of technical sophistication, is highly inefficient and incurs approximately 10 000 accidents a year.

Plan

The principal objective is to eliminate state mines' huge accumulated losses by 1998 and to convert 70 per cent of mines into profit-making businesses by 2000. To achieve this, the coal industry aims to reduce employment by 1 million people by 2000, from 3 million in February 1996 and 5.5 million in 1992. The Government has agreed to open coal mines, including those that are not loss making, to foreign investment and to permit majority foreign equity. It is seeking US$17.5 billion in foreign investment during 1996-2000 (EIU, 1996d). However, the necessary rules are yet to be established. The Government also aims to progressively reduce the amount owed to state-owned coal mines under triangular debt.

The Three Gorges Dam

China's Three Gorges Project on the Yangtze River in Hubei Province will be the largest hydroelectric power plant in the world when completed. The main dam will rise 175 metres and span 2 310 metres, five times more than Hoover Dam in the USA. Although it will bring substantial benefits in terms of flood control, clean power generation and improved navigation, it also will have significant costs, displacing some one million people (mostly farmers), inundating 27 000 hectares and benefiting mainly downstream population centres.

Conceived in 1918 to ameliorate the damage of regular flooding, the US$30-plus billion project was finally approved in 1992. According to current plans, it is to be completed in 2009, although the plant is to start operating in 2003.

Flood Control
More than 15 million people will be better protected from flooding along the Yangtze, including in Hubei's capital, Wuhan.

Power Generation
Three Gorges should generate 84.7 billion kwh per year when completed, equivalent to one twelfth of current power consumption and one twentieth of projected consumption in 2009. This capacity will replace burning 40 to 50 million tonnes of coal. The main beneficiaries will be eastern and central China.

Navigation
The 660 km waterway between Yichang (40 km from the dam site) and Chongqing will open to barge fleets of up to 10 000 tonnes (versus 3 000 tonnes now), and annual shipping capacity will rise from 10 million to 50 million tonnes. Shipping costs will drop by one third. Temporary locks will assist navigation during the dam's construction.

Funding
The China Yangtze Three Gorges Project Development Corporation projects a total funding requirement of US$30 billion. In addition to a national tax on electricity, which raised ¥4 billion in 1995, funding will come from domestic borrowing, revenues from the Three Gorges project itself from 2003, and possibly foreign finance, though no details are available.

Sediment and Erosion
While some critics say that the dam will silt up in as little as a decade, Chinese officials say that they are taking effective measures to ensure that the dam will retain 90 per cent of its generating capacity even after 100 years. They also assure environmental groups that extensive erosion control efforts are underway.

Pollution
With about 1 billion tonnes per year of polluted water entering the Yangtze upstream from the dam site, the World Bank has agreed to provide US$180 million to Chongqing to deal with water pollution. The Development Corporation is responsible for cleaning up flooded towns and removing polluting industries and waste sites.

Tourism
While some famous natural attractions will be lost, Chinese officials say important cultural relics will be moved and scenic beauty will not be greatly affected. The dam will also become a tourist attraction.

Opportunities for Australians
Officials welcome foreign involvement in the dam project, especially if accompanied by concessional loans or grants. Australia has considerable experience in large hydroelectricity projects, including the Snowy Mountains project, and environmental management that could be relevant to the Three Gorges Project. The main opportunities for Australian companies appear to lie in construction, road building, telecommunications and provision of related equipment.

Administration

This strategic sector comes under direct state control, with the Ministry of Coal Industry (MCI) the

authorities. State and provincial mines produce 60 per cent of China's coal; township enterprises produce the rest (with their share increasing annually). An estimated 40,000 mines operate without MCI approval. Provincial mines have huge associated assets in schools, hospitals and other services.

Reform

Since 1993 the coal industry has undergone a major restructuring. About half a million surplus workers have already been transferred from mining to other businesses, and the price of coal is being gradually deregulated. The central Government is providing the MCI with interest-free loans to undertake restructuring and job shedding. The aim is not to expand production or launch new projects, but to renovate existing facilities and upgrade existing technologies. Preparation, transport and storage of coal are bigger problems than production.

In 1997, 14 state-owned coal companies are to be merged into four entities:
1. China Coal Industry Import & Export Group (trade)
2. China Coal Comprehensive Utility Group (delivery)
3. China Coal Construction & Development Group (industry development)
4. China Coal Materials & Equipment Group (procurement)

The increase in the coal prices, together with the shedding of excess labour, have seen the coal industry's losses fall five-fold from 6 billion yuan in 1992. The Ministry has also taken measures to reduce triangular debt by banning delivery of coal unless old debts are settled or new orders are paid in cash or commercial drafts. As a result, in 1995 the state coal mines recovered 8 billion yuan in past debts, reducing the total triangular debt from 29 billion yuan to 21 billion yuan, with a further 25 per cent drop projected for 1996. According to the EIU (1997b), half of China's state-owned coal mines are now profitable.

Oil and Gas

Petroleum meets less than 20 per cent of China's energy needs. China is the world's fifth largest oil producer.

Plans

China plans to expand annual oil production from 149 million tonnes to 185 million tonnes by 2000. This plan appears to be very ambitious, given that growth in the last five years has been flat. Demand is expected to exceed supply by up to 50 million tonnes a year by 2000.

In the gas sector, supply and distribution badly need upgrading. The focus is on developing gas reserves in Sichuan and the northwest. The key gas project in the Ninth Five-Year Plan is coal bed methane recovery and development, which is expected to require 1-1.5 billion yuan over the next 5 to 10 years. Gas output is expected to reach 20 billion cubic metres by 2000**.**

Administration

The oil and gas industries are exclusively state owned, with development policy heavily weighted towards petroleum production. China National Petroleum Company (CNPC) carries out onshore oil exploration and production), while China National Offshore Oil Corporation carries out offshore activities. Of the 60 oil refineries, 37 are directly owned by China Petrochemical International Corporation (Sinopec) and CNPC's subsidiary, China Oil and Natural Gas Exploration and Development Corporation. A few refineries are owned by municipalities. Sinopec and CNPC also own distribution and storage facilities.

Reform

Oil pricing has been undergoing reform since the 1991 shift from subsidised pricing to world parity pricing. Oil products supplied under state quotas are subject to price controls, but increasing quantities are being decontrolled. Only the People's Liberation Army continues to enjoy subsidised oil.

PART 2

INFRASTRUCTURE FINANCING

This section briefly examines sources of finance for Chinese infrastructure: provincial and local governments, state development banks, Chinese international corporations, multilateral agencies and Australian bilateral aid.[5] It also assesses the role of private foreign investment.

While infrastructure and environment projects are funded predominantly from domestic sources, overseas entities are playing an increasingly important - indeed vital - role (Table 3). The telecommunications, power and urban water supply sectors depend least on budget funding, reflecting their ability to generate funds via user charges. Coal and rural water, subject to price controls, are the most budget-dependent.

Table 3
Foreign Funding Small but Rising Steadily
China's Fixed Asset Investment by Source of Funds
Per Cent Share, 1978 to 1995

	per cent of total		per cent of total	
Year	**1978**	**1985**	**1990**	**1995**
State budget allocations	62	16	9	3
Domestic loans	2	20	20	20
Self-generated funds[1]	-	-	52	52
Foreign funds[2]	4	4	6	11
Other	32	60	13	14
TOTAL	100	100	100	100

Notes:
1. Self-generated are retained earnings and other funds raised directly by enterprises.
2. Foreign funds include foreign borrowings, aid receipts and foreign direct investment.
Source: State Statistical Bureau, 1994 and 1996

Provincial/Local Government Fundraising

Provincial and local governments can raise funds for infrastructure through:

- **borrowings**
  China's 1994 Budget Law forbids provincial and local government from borrowing directly, in the interests of macroeconomic management. However, local governments borrow through enterprises under their control. This creates substantial risk as they incur contingent liabilities.
- **user charges, surcharges and quasi taxes**
  All levels of government collect user charges, surcharges on utilities and actual, or informal, taxes. Many are designated for specific purposes, such as the 'airport user charge' levied at all airports which is to go towards airport upgrading.
- **retained earnings and other self-generated funds**
  These account for a large proportion of infrastructure funding. However, the ability of different sectors to generate funds for investment varies considerably. Railways' mounting operating losses have left them unable to maintain the existing system, let alone undertake further investment. While the standard freight charge is centrally controlled, railways can levy a surcharge of 0.027 yuan per ton kilometre to fund new works. (See Guangdong Railway Group box.) The electric power industry, on the other hand, is shifting towards greater self-funding, with most provided by provincial and local governments. Up to 20 per cent may be sought from overseas sources.

China's International Financiers

[5] The East Asia Analytical Unit will examine *Infrastructure Financing in Asia* in a detailed report to be released in early

By the end of 1994, some 900 Chinese corporations had established over 4600 affiliates in 130 countries (UN *World Investment Report*, 1995), primarily to raise funds from international capital markets, mainly Hong Kong and New York. These entities play an increasingly important role in China's infrastructure project financing.

State Development Banks

In 1994, the Chinese Government changed the structure of the banking system to separate 'policy' lending (for key projects, mostly infrastructure) from commercial lending, to enable banks to develop along more commercial lines. It established three development banks reporting to the State Council: the State Development Bank, the Export-Import Bank and the Agriculture Development Bank.

The State Development Bank lends about US$10 billion per year, mainly for large and medium sized projects, including such infrastructure projects as the Qinshan and Ling-ao nuclear power plants, Three Gorges Dam, Beijing-Kowloon highway and Haikou Airport. Its main sources of funds are:

1. Budgetary appropriations. The Ministry of Finance disburses funds to the State Development Bank strictly in line with specific projects' implementation progress. In the provinces, it acts through local branches of the People's Construction Bank of China in agency or trust arrangements on a commission basis.
2. Bonds. The State Development Bank places bonds with other banks and Urban Credit Coops to tap into their deposits, in effect extracting resources through a 'reserve requirement'. The bonds are placed with specialised and provincial commercial banks on the basis of their excess reserves. The Bank is considering issuing bonds directly to the public. It also raises funds internationally, including US$50 million in syndicated loans in 1995 and 30 billion yen (US$320 million) in 10-year samurai bonds in 1996, mostly for power projects. Moody's assigned the Bank an A3 rating for its long-term senior debt in 1996.

The State Development Bank's responsibilities include intermediating foreign loans and issuing both bond issues for hard loans and budget allocations for soft loans. Capital construction loans mature in 10 to 20 years, 'technical transformation' loans in 5 to 8 years. The Exim Bank finances capital equipment imports and assists exporters. Nearly 40 per cent of its $2.3 billion in loans to the end of 1995 was for equipment for electric power projects.

CITIC Pacific, the Hong Kong-listed subsidiary of CITIC, is a major investor in Chinese infrastructure projects, with equity in power stations, bridges and tunnel projects, as well as Hong Kong Telecom, Cathay Pacific and its subsidiary Dragonair.

Huaneng International Power Corporation, Shandong Huaneng Power Development Company and Zhenhai Refining Company, which have B-class shares listed on the Shenzhen and Shanghai stock exchanges, have all attracted foreign investment. The first two are also listed on the New York Stock Exchange. While the total amounts raised by foreign equity listings are small, this activity indicates firms' growing confidence that they can meet the listing requirements of international stock markets.

US investment bank Morgan Stanley (35 per cent) has set up a US$350 billion joint venture, China International Capital Corp Ltd (CICC), in Beijing with People's Construction Bank (42.5 per cent), China National Investment and Guaranty Corp (7.5 per cent), Singapore Government Investment Corp (7.5 per cent) and Mingly Corp (7.5 per cent). CICC's first project was to advise Jilin Oil and Natural Gas Development Co in northeast China on financial standardisation, restructuring, asset valuation and international fundraising. CICC will also underwrite equity securities, trade in foreign exchange, underwrite and place renminbi securities and engage in international money market activities. Other companies are expected to follow suit.

Multilateral Agencies

The World Bank and the Asian Development Bank lend China substantial sums for infrastructure development, much of it on a concessional basis. Their objectives are to:

- support economic adjustment and social development, where these would otherwise go unfunded
- influence policy by funding particular activities, such as environmental management.[6]

Both institutions have large programmes in China. The World Bank funds activities in most sectors, including environment and infrastructure, and the Asian Development Bank focuses primarily on large infrastructure projects. This is because China has access to International Development Association credits as well as ordinary World Bank lending. China does not have access to the Asian Development Bank's concessionary Asian Development Fund credits and therefore does not borrow from the Asian Development Bank for health, education, environment and poverty alleviation projects (AusAID, January 1997).

The World Bank and the Asian Development Bank generally have a high regard for their loan activities in China, mainly because of China's capacity to dedicate high quality human and financial resources to project implementation, and its excellent repayment record. Nevertheless, in response to criticisms over the past decade (for example, that money not always been used efficiently) multilateral agencies are increasing surveillance of loans and grants (World Bank, 1995; Asian Development Bank, 1995). While multilateral agencies and the central Government may be strongly committed to particular noncommercial projects, some local authorities may be less than enthusiastic if they must commit financing to projects with no immediate tangible return. Local authorities, for example, worry that the extra loan burden they will incur will not be offset by a 'social benefit'. They point out that developing cities in China don't have the money or resources for environmental projects with no measurable economic returns (International Market Assessment, 1996).

Indeed, projects can face lengthy delays as authorities work difficult measures through the political system. In the East Lake (Wuhan) water clean-up, for example, the government had agreed to raise sewerage charges to help cover the costs of the project as part of the World Bank loan agreement. The project was delayed by some six months as the authorities had to pass the agreed tariff increases through local government councils to establish the appropriate financial positionof the sewerage companies, who were among the main beneficiaries of the porject. The project is now going ahead. (World Bank, 1997a).

Some Chinese officials prefer Japanese overseas development assistance to multilateral loans, as they perceive it involves fewer policy commitments. However, the Japanese are now *also* focusing on environmental issues (East Asia Analytical Unit, 1996), reflecting:

- Japanese concern over air pollution flows from China to Japan
- concerted international moves to increase awareness of the environmental impact of China's growth and to encourage Chinese policy makers to take action.

World Bank

The World Bank has rebalanced its priorities in China in recent years, preferring to concentrate more on projects addressing environmental and urban problems than commercial projects for which commercial funding is becoming available (Table 4).

Table 4
World Bank Lending to China: Commitments and Disbursements
1991 to 1996

	1996	**1991-1996 cumulative**
Commitments	US$2970 million	US$16 317 million
Disbursements	US$2219 million	US$10 419 million

Source: World Bank, 1996.

Infrastructure has always been central to World Bank support for East Asia and now accounts for about half of annual commitments. The World Bank champions the development of public-private partnerships in nearly every East Asian country. In China, this involves direct support for power sector reform, transport development, potential partial risk guarantees for road and power projects, and indirect support to develop a framework for private investment, including legal and judicial system reforms, regulations for transparent bidding, BOT laws and development of capital bond markets.

The Bank has also formed a special unit devoted to infrastructure development in Asia, with primary focus on the private sector. Meeting East Asia's vast infrastructure needs in coming years can only be done by substantially increasing the role of the private sector. The Bank estimates that private capital at risk currently accounts for at most 10 per cent of East Asian infrastructure investment, but that this should rise to 30 per cent over the medium term. Achieving this will require a combination of political will and institutional reform to develop competitive market structures in some areas (telecommunications and power generation), sound regulatory regimes in others (transport, water, sanitation) and effective financing mechanisms (World Bank, 1997b).

Australian Cofinancing

Australia's international aid agency, AusAID, is currently cofinancing 11 ongoing projects with the World Bank in China. The projects, which involve Australian consultants and contractors, include:

1. *Disease prevention and health promotion*: reinvigorate immunisation programmes, control noncommunicable diseases and STDs/HIV
2. *Guangxi urban environment*: sewage and waste water management in Nanning, water management in Guilin
3. *Sichuan urban environment*: reverse water and land degradation in Chengdu and Chongqing
4. *Highway planning and evaluation*: assist the Ministry of Communications to develop improved methodologies to prioritise highway investments and feasibility studies
5. *Hubei urban environmental project*: waste water treatment in Wuhan, Huangshi, Xiangfan, Yiching
6. *Shanghai environmental masterplan study:* water quality improvement
7. *Second Shanghai sewage review panel*: technical review of new waste water outfall on Yangtze River
8. *Housing and social security reform*: management control systems
9. *Grain distribution and marketing:* providing facilitites and systems to handle the shift from planned procurement and sales to competitive wholesale markets, including handling, transport, storage, distribution, markets
10. *Feed industry development/animal feed project:* support for soyabean production in Henan Province and for integrated feed and livestock production demonstration areas in Jianxi, Hunan, Guangxi, Hainan and Sichuan Provinces
11. *Seed sector commercialisation:* pilot programme for selected seed companies, policy reform, institutional strengthening for public organisations servicing the industry, support for village cooperatives and farmers.

Virtually all of these activities have institutional strengthening and training elements.

Asian Development Bank

While China does not have access to the Asian Development Bank's soft-loans arm, the Asian Development Fund, ordinary lending commitments will exceed US$1.2 billion per year through 1998, mostly for infrastructure projects (Table 5). The Asian Development Bank also supports around 40 technical assistance projects, valued up to US$500 000 annually.

The ADB focuses on three areas in China:

1. Improved economic efficiency
2. Environmental protection/natural resource conservation
3. Poverty reduction.

"The Bank supports market-oriented reforms and the development of appropriate institutional systems. Critical issues associated with rapid economic growth, such as transport bottlenecks, energy shortages, water shortages for agriculture and in urban areas, environmental degradation and growing income disparities are also to be addressed" (Asian Development Bank, 1995, p. 97).

Table 5

ADB Focuses on Transport, Communications, Energy

Cumulative ADB Lending to the PRC

1995

Sector	Number of loans	US$ million	Per cent of total
Transport and communications	18	1986	38
Energy	10	1236	23
Industry and nonfuel minerals	4	575	11
Finance	5	470	9
Agriculture and agro-industry	7	450	9
Multisector/others	3	401	8
Social infrastructure	1	160	3
TOTAL	**48**	**5276.7**	**100***

Notes: *Total does not equal 100 due to rounding.
Source: Asian Development Bank, 1995.

From 1996 to 1998, the Asian Development Bank will focus its lending activities on projects supporting economic growth, including an increasing proportion 'having secondary features addressing social and environmental concerns'. By sector (similar to the table above), 30 to 40 per cent of lending is earmarked for transport and communications, 20 per cent for energy, 15 to 20 per cent for industry and nonfuel minerals, 10 to 14 per cent for agriculture and agro-industry, 10 per cent for social infrastructure, and none for 'multisector/others'.

Bilateral Aid

Japanese Overseas Development Assistance (ODA)

Japan is China's primary bilateral aid provider. (East Asia Analytical Unit, 1996, *Asia's Global Powers: China-Japan Relations in the 21st Century*.) Almost half of Japan's Overseas Economic Cooperation Fund (OECF) loans go China, mostly for infrastructure projects. Japan's aid flows to China were cut significantly in 1995-1996 in response to China's nuclear tests; negotiations are now resuming.

Japan's ODA to China focuses on:

- inland agricultural development, aid to farming communities, natural resource development
- grant aid and technical cooperation to assist in poverty reduction
- economic infrastructure including transportation, communications and electric power (US$3.4 billion for railway development alone from 1984 to 1994)
- environment, health and human resource development.

Australian Overseas Development Assistance

Of the US$3.5 billion that China receives in foreign aid annually, $2.8 billion comes from Japan, Germany and the World Bank (International Development Agency). Australia's grant aid to China amounted to A$55 million in 1996-97. Most of Australia's foreign aid goes to poverty reduction and environmental protection projects which are not financially viable and therefore would not attract private investment (Table 6).

Regional Development. Remote and inland provinces have not enjoyed the same economic and infrastructure development or investment as the coastal region. Australian assistance supports institutional strengthening in provincial agricultural services, sustainable livestock production and enhanced land-use information systems.

Education and Training. More than 200 students undertake studies or training in Australia each year on full scholarships. AusAID assists a range of tertiary and research institutions in China to establish collaborative ties with Australian institutions in science and technology, economics and law, health and social services.

Community Development. Despite China's success in reducing the number of absolute poor, it still has approximately 350 million people living in poverty today, mostly in the inland provinces. (See box in Chapter 1 - Overview of Economic Reforms.) Australia is supporting a major project which will establish a microcredit scheme to support villager-initiated income-generation activities and improve community infrastructure. Funding is also going to a relatively small number of Australian nongovernment aid organisations to implement a variety of activities relating to income generation, provision of water supply and sanitation facilities, HIV/AIDS education and animal husbandry.

Health and Population. Population growth remains a fundamental challenge, with about 13 million people being added each year to China's 1.24 billion population. Such growth has serious consequences for both the environment and the country's capacity to provide basic services. Australia is providing support for a project which demonstrates the viability of a voluntary approach to family planning and integrates it into the delivery of women's and children's health services.

Environment. China faces significant challenges in managing its environment, particularly vulnerable resources like water, air and soil. In Inner Mongolia, Australia is providing technical assistance to develop means of livelihood alternative to direct grasslands grazing. Australia is also assisting in planning and policy formulation to rehabilitate the 20 000 hectares of land degraded each year by mining waste deposits.

Other. Includes activities such as the Project Administrative Support Unit (locally engaged staff at the Embassy in Beijing who have liaison and monitoring responsibilities) and the Private Sector Linkages programme which provides seed money for joint ventures.

Table 6

Australian Aid To China: 1996-97 Programme Outline

Ongoing Programmes	Comment
REGIONAL DEVELOPMENT	
Agricultural Support Services	Parallel financing with World Bank in 10 provinces
Hebei Livestock Production	Large project on watershed protection
Land Use Information Systems	Large project in Hainan
Jilin Grain Handling	
Sheep Research	
Regional Activities	NGO funding, wool, other departments
ACIAR	Small agricultural research projects
EDUCATION AND TRAINING	
ASTAS (scholarship awards)	89 on award from previous years + 16 new
ADCOS (scholarship awards)	118 ongoing and 12 new
Institutional Links Phase 2	Funding of links with Chinese universities
Economic/Foreign Trade Training	Preliminary activities; Beijing Ministries
Other Human Resource Development	Some project development/completion costs
COMMUNITY DEVELOPMENT	
Qinghai Poverty Alleviation	Large project; income generation
CHANGES Projects	NGO activities (4) in poorest counties
Food Aid	
HEALTH & POPULATION	
Ningxia Health & Family Planning	Primary/maternal health and services
Tibet Primary Health Care	Feasibility study for health/sanitation projects
Hepatitis Diagnosis Improvement	
Guangdong Reproductive Health and Family Planning	
ENVIRONMENT	
Mine Waste Management	Mine site rehabilitation
Inner Mongolia Grasslands	New project; environmental emphasis
OTHER	
Private Sector Linkages Programme	16 activities approved
Other	PASU, small activities
TOTAL AID FLOWS	**A$54.3 million**

Source: AusAID, 1997

Foreign Private Sector Participation

China's investment requirements for infrastructure development and environmental management over the next 10 to 15 years are of such magnitude that they surpass the capacity of domestic capital resources. As a result, China will need considerable foreign funding to ensure sustained development. Although China has been reluctant to assume more than soft credit to date, as multilateral agencies move more toward social benefit programmes, infrastructure works (at least in the more developed provinces) will increasingly be funded through commercial loans or equity. Foreign capital may contribute as much as one fifth of China's infrastructure and environmental project outlays over the next 10 years. The Ninth Five-Year Plan particularly emphasises securing foreign investor support for roads and power stations.

However, despite official policies to encourage private build-own-transfer (BOT), build-own-operate (BOO), build-own-operate-transfer (BOOT), and other such infrastructure development options, foreign investor uptake has been slow.

China's BOT Investment and Development Corporation attributes this to:

- relevant regulations being finalised only now
- investor caution over foreign exchange risk[7]
- unfavourable tax treatment
- lack of government guarantees on returns (companies argue that the return is effectively capped at a level too low to interest them)
- tariffs charged to users being so low as to cover only a fraction of investors' costs.

In addition, strong resistance exists to foreign ownership of essential infrastructure, stemming from the nineteenth century when railways and coastal shipping were foreign-controlled.

Minority Deals Possible

In response to cool investor interest, China introduced in 1996 additional laws and regulations covering foreign participation in infrastructure development, hoping to encourage investment in roads, bridges, airports, light rail systems and power stations. Foreign firms can participate in airports, seaports and rail track construction through (primarily minority) joint ventures. Power transmission, telecommunications and national railway operations remain off-limits to foreigners, and the oil and gas industries are almost entirely state owned.

However, companies wishing to enter sectors nominally closed to foreign investors can sometimes gain special approval if the local partner has significant influence within the relevant ministry. Telecommunications firms are hoping for special one-off deals, as these tend to precede a more general opening. Joint ventures may also become possible in local rail projects, according to officials in the Ministry of Railways.

International companies believe that if the Government is to attract the required scale of foreign capital, expertise and technology, it will have to make further progress in:

- providing appropriate incentives for investors
- achieving greater convergence in perceptions of risk
- overcoming counterproductive rivalry among ministries and levels of government
- strengthening the legal system to:
  - protect foreign investors and their property
  - enhance transparency, consistency and predictability of rules across government
  - improve enforcement of laws and regulations.

Similarly, Chinese officials point out that foreign companies must also overcome deficiencies by:

- clearly indicating their qualifications and fully addressing particular projects' selection criteria
- meeting all the tender requirements, including submitting complete documentation
- demonstrating that committed project financing will be forthcoming as required
- being prepared to assume some risk
- developing the relationships and cross-cultural understanding so necessary to succeed in China.

Advances in these areas, say officials, will hasten the processing of proposals and improve tender success rates.

Some advances on both sides are becoming apparent. In the power sector, for example, foreign companies' and bankers' insistence on credit and foreign exchange guarantees is easing, and the Chinese Government is offering more reasonable rates of return (EIU, 1997). Innovative financing techniques such as those arranged for the Zhuhai Highway (*China Law & Practice*, 1997) and a number of power deals (*Far Eastern Economic Review*, 1997) are also starting to make a difference.

Advice from an 'Old China Hand'

- Do not even consider China projects unless you have staff who are experienced and skilled in doing business and running projects in China (people who remain calm in dealing with constant change, uncertainty and highly challenging problems).
- Design a team with complementary skills, combining 'hard drivers' with patient, painstaking staff, and including both Chinese and non-Chinese.
- Do some soul-searching and ask if you are ready for China; don't be starry-eyed and don't believe everything you hear from the road shows.
- Carry out thorough due diligence analyses.
- Do not expect to find necessarily consistent or accurate statistics or market/project information.

Risk Management in Chinese Infrastructure:
Commonsense Project Management Techniques

Risk Factors	Mitigation Strategies
Shift in priorities taking committed projects off the agenda	Do not commit resources beyond Purchasing Authority's progress payments.
Project delays due to Chinese bureaucratic indecision and unclear authority lines between central ministries and among central, provincial and local authorities; ambiguous paths of accountability and responsibility	Understand the roles and requirements of the multiple agencies involved and develop risk-reduction strategies for each. In very few cases can projects be realised within one agency.
Absence of effective resort to legal sanctions No sovereign guarantee to mitigate risk	Ensure contracts specify international arbitration for very large projects. While local arbitration mechanisms are improving, even when a case has been won actual compensation is difficult to achieve.
Nonpayment on projects that cannot be 'turned off' (example: Hopewell's expressway) Chinese authorities are increasingly unwilling to sign long-term purchase agreements for output (such as power and water); it can take 10 years to recoup capital costs. (Power to grid has no clear link; this implies a risk unless the company has a clear agreement with the Power Authority. The government may commission a company to build a power plant and specify that the facility must run 18 hours/day at full capacity. The company's payment and return estimates are based on this. Then, when the plant is ready, the government says that it needs it to run only 12 hours - but will pay the same rate per megawatt hour. The problem is that the company has based its investment on the original plan of running at full capacity and suddenly this is cut back by a third, meaning that pay-back will be delayed.)	Ensure that projects have clear boundaries that correspond to a mechanism for payment (for example, power supply to a local township). Cutting off supply due to nonpayment, however, is easier said than done. Companies have been known to walk away from investments rather than risk confrontation.
Cost blowouts due to third-party delays and poor project coordination. (For example, a foreign company building a grain loader/unloader at a port needs rail sidings and road links to be built by different agencies. Poor coordination leads to such things as roads being built where the rail line was meant to go. The company responsible for the grain loader cannot start work and its equipment and people sit idle. Capital is tied up and stress levels are high.)	Make clear that 'completion of contract' (that is, payment) stipulates, say, one quarter of payment when equipment lands. Gear staff and capital levels up and down in line with progress (for example, don't ship the whole project engineering team to Shanghai until it is clear that their services will be utilised forthwith).

Note: This table touches only the surface of the issues, and most of the strategies (payment, milestones, resourcing, project boundaries, etc) are common to projects around the world, including Australia.
Source: International Market Assessment, 1996

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