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# The Private Sector and Power Generation in China

*Energy and Mining Sector Unit  
East Asia and Pacific Region  
The World Bank*

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# The Private Sector and Power Generation in China

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*Energy and Mining Sector Unit  
East Asia and Pacific Region*

*The World Bank  
Washington, D.C.*

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## FOREWORD

Since the early 1980s, the Chinese Government has been gradually easing entry in power generation and ensuring private participation in power sector development. It first proceeded with several pilot projects and gradually expanded opportunities for private sector investment, mainly through establishment of joint ventures for developing greenfield projects or securitizing existing assets, BOT arrangements and listing of power companies in local and foreign stock markets. The progress achieved has been impressive and widely recognized.

However, in the aftermath of the Asian economic and financial crisis, concerns are being voiced about Renminbi devaluation and the impact of the slowdown of electricity growth on the implementation of past contracts and new investment opportunities.

To assess these emerging concerns, China's Ministry of Finance and the World Bank sponsored a two-day conference, held in Beijing June 22-23, 1999. The conference aimed mainly at improving understanding and narrowing the gap in perceptions of risks related to project development between government officials, representatives of provincial power companies and financial institutions, and private investors.

The first part of this publication is dedicated to the narrative summary of the conference. The second part presents a background paper prepared for the conference to take stock of the progress achieved and identify issues and problems that still need to be addressed to create an environment conducive to further private involvement in power sector development.

In publishing this volume, we very much hope it proves to be useful to the international community that is interested in past and future development of private sector involvement in China's power sector.

Yukon Huang  
Country Director  
China Country Unit  
East Asia and Pacific Region

## **ABSTRACT**

This paper discusses issues and problems related to private sector involvement in China's power sector in two parts.

The first part, a summary of the conference held in Beijing June 22-23, 1999, stresses that despite the problems encountered and the impact of the Asian economic and financial crisis, China's power sector remains attractive to investors because of its size, growth potential, and the improving business and regulatory environments. The discussion at the conference highlighted the need for more transparency in the implementation of the reforms and regulatory framework, streamlining of the project approval process, and improving creditworthiness of power offtakers.

The second part, a paper prepared by Jianping Zhao on private power development in China, assesses the current status and future prospects of private sector involvement in China's power sector. It outlines the key characteristics and indicates some future developments for the different forms of private sector participation that have emerged and developed since the early 1980s. It, finally, provides a review of some concerns voiced by investors and provides a preliminary assessment of their impacts on future investments.



## ABBREVIATIONS AND ACRONYMS

BOO	Build-Operate-Own
BOT	Build-Operate-Transfer
ECA	Export Credit Agency
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GOC	Government of China
GW	Gigawatt
HIPDC	Huaneng International Power Development Company
IPO	Initial Public Offering
IPP	Independent Power Producer
ITIC	Provincial Investment Company
JV	Joint Venture
kW	Kilowatt
kWh	Kilowatt-hour
MOC	Ministry of Communications
MOEP	Ministry of Electric Power
MOFTEC	Ministry of Foreign Trade and Economic Cooperation
MOU	Memorandum of Understanding
MW	Megawatt
PPA	Purchase Power Agreement
ROR	Rate of Return
SAAB	State Assets Administration Bureau
SAFE	State Agency for Foreign Exchange
SAIC	State Administration of Industry and Commerce
SDPC	State Development and Planning Commission (formerly SPC)
SEPA	National Environmental Protection Agency
SETC	State Economic and Trade Commission
SOEs	State-Owned Enterprises
SP	State Power Corporation
SPC	State Planning Commission



**PART ONE: PRIVATE POWER AND INVESTMENT  
OPPORTUNITIES IN CHINA**

(Beijing, June 22-23, 1999)



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## CONFERENCE SUMMARY

A Private Power Conference, sponsored by China's Ministry of Finance and the World Bank, was held in Beijing June 22-23, 1999.<sup>1</sup> The conference agenda and list of participants follow this summary.

### Conference Background and Organization

The conference took place in response to growing concerns about the future of China's power sector and the role of and support for private sector participation. Principal concerns include the following: (a) the Asian economic and financial crisis is affecting the economy, even though to a lesser extent than in other East Asian countries, and fueling speculations about devaluation of the Renminbi; (b) electricity demand is growing at a slower pace in most provinces and even declining in some; and, more importantly, (c) Chinese operators, foreign developers and the international financial community are increasingly worried about the implementation of past contracts.

On the Chinese side, the government seems reluctant to continue providing letters of support beyond pilot projects; and are concerned that high rates of return required by developers may result in high electricity prices. The State Power Corporation (SP) and its affiliated power companies are dissatisfied with the "take or pay" obligations and the requirement for minimum guaranteed dispatch associated with current power purchase agreements (there is an increased perception of inequitable allocation of market risks), especially in provinces where there is excess generating capacity.

From the perspective of foreign developers and international financiers, project development and implementation remain very difficult in China despite acknowledged successes during the last decade. The project approval process is cumbersome and less than fully transparent; the underdevelopment of the legal and regulatory framework greatly increases the uncertainty and risks relating to the projects; the requirement of increased domestic content limits the ability of project developers to involve Export

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<sup>1</sup> The conference was jointly organized by N. Berrah and D. Girdis in the World Bank Headquarters in Washington D.C. and E. Sun, J. Zhao and R. Ma in the World Bank Country Office in China with the active support of the staff of the International Department of the Ministry of Finance. This summary note was prepared by N. Berrah, R. Fitzgibbons, D. Girdis and R. Tomkins. It was reviewed by Y. Albouy, M. Farhandi, B. Trembath, D. Lilaoonwala, E. Sun and J. Zhao of the World Bank Group; Yang Qing, Deputy Director General, Department of Planning, Finance and Investment, State Power Corporation; Zhao Hubin, Deputy General Manager, Zhejiang Provincial Power Company; K. Wall, Barclays Bank; and I. Parker, National Power.

Credit Agencies and to introduce technological innovation; the potential breaches of support agreements (especially dispatch of the units to ensure adequate revenues) and payment defaults caused by insolvency of large state-owned enterprises are undermining financiers' confidence in the "sanctity" of power purchase agreements.

As noted by Yukon Huang, Country Director and Chief of the Country Office of the World Bank in his introductory remarks, the conference was organized by the Ministry of Finance and the World Bank to provide an opportunity to discuss the foregoing concerns among senior executives and representatives of the Chinese Government, SP and its affiliated power companies, project development companies, financing institutions and the World Bank Group.

Three sessions, consisting of 15 presentations, and 3 roundtable discussions provided a forum for open dialog among over 100 participants about the following key issues:

- Macroeconomic background, particularly the economic growth outlook in the aftermath of the Asian economic crisis and the stability of the Renminbi;
- Financing options experienced in China, mainly limited-recourse financing associated with joint ventures (for development of greenfield projects and securitization of assets) and build-operate-transfer (BOT) arrangements for generation projects, and equity financing through listing of power generation companies on international and local stock markets;
- Future of the Chinese power sector given the recent slowdown in growth of electricity demand and the stagnation of direct foreign investment in the country;
- Changes in risk profile and increased apprehension and concerns expressed by power project developers in light of the impact of the Asian economic crisis on private power investments in other Asian countries (especially Indonesia and Thailand) and the increasing reluctance of provincial power companies to solely bear market risks; and
- Reform initiatives, especially the announced gradual transition from the single buyer model to provincial competitive markets, and their impact on private investment in the sector.

### **Stability of the Macroeconomic Situation Despite the Regional Turbulence**

Zhu Guangyao, Director General of the International Department of the Ministry of Finance, and Li Ruogu, Director General of the International Department of the People's Bank of China, stressed the continued strength and stability of China's

economy, and attractiveness to foreign investors. The country has been far less affected by the Asian economic and financial crisis compared to other countries in the region. Gross domestic product (GDP) growth, which has fallen from annual rates exceeding 10 percent in the early 1990s to rates slightly above 7 percent in 1997 and 1998, remains among the highest experienced worldwide. Following a reduction of about 5 percent in 1997, foreign direct investments increased by 2 percent in 1998 and are expected to grow at about the same level in 1999.

The underlying economic fundamentals remain strong despite the visible effect of the Asian economic crisis. Foreign trade growth dropped to 0.2 percent in 1998 after a sustained growth at about 15 percent up to 1997 but rebounded to 8 percent during the first half of 1999. Exports to North America and Europe grew substantially to offset the reduction of exports to traditional markets in Asia, mainly Japan. Foreign exchange reserves increased to nearly US\$150 billion and China's debt level and debt service ratio remain very low as a percentage of GDP, while its debt structure is sound with short-term debt accounting for around 15 percent of the total.

However, the Chinese government remains aware of the potential threats to the economy (foreign capital flight, loss of competitiveness, drop in consumers' confidence, etc.) and is striving to continue to provide a stable environment for domestic investment and household consumption to maintain growth.

A key component to macroeconomic growth and attracting investment to China has been the stability of the Renminbi despite the extensive currency devaluation experienced in emerging markets, particularly in East Asia. Li Ruogu noted that while China has committed itself to avoiding devaluation of the Renminbi and potential exacerbation of the regional crisis, it is a little known fact that more than 80 percent of trade in China's currency is at market-determined rates and not the government-determined rate. In conclusion, Li noted that the Renminbi could, as for all currencies, be subject to fluctuations determined by the market. However, the Chinese government is committed to maintaining the Renminbi's stability through monetary and economic policies aimed at sustaining the strength of the fundamentals of the economy.

This assessment is consistent with recent market trends but investors continue to carefully monitor threats and uncertainties that could endanger economic growth and China's sovereign rating. These include mainly China's competitiveness and related stability of the Renminbi, social and economic impacts of the reform of the state-owned enterprises (SOEs), emerging difficulties faced by financial institutions at the provincial level (ITICs), and government policies and regulations, especially those related to infrastructure investments, that would reduce China's attractiveness compared with other countries.

## **A Fast-Growing Power Sector and Increased Private Involvement**

To support this sustained and strong economic growth, China's power sector grew at more than 8 percent from 1980 to 1998 to become the second largest system in the world with 277 GW of installed capacity. However, in 1997 and 1998, demand growth fell to 4.5 percent and 2.6 percent, respectively, raising concerns about overcapacity and future development of the sector.

As reported by Wang Xingmao, Director of the Economic Research Center of SP, these fears began lessening in the first half of 1999 with clear signs of rebounding electricity growth in many provinces. The slowdown of the two past years was beneficial in tempering the overly optimistic expectations about the future of the sector. However, China still has considerable potential for growth considering its expected strong economic development and still very low per capita consumption (about 6 percent of the per capita electricity consumption of United States and 22 percent of Korea's and 42 percent of Mexico's, respectively).

Despite the recent slowdown, the investment climate for private power in China has continued to be relatively strong. The government allowed the first experiments involving private investors in developing power projects in the early 1980s to help meet the growing investment and financial requirements. Following the early successes, it gradually moved to develop and implement a framework for private participation in the Chinese power sector. Jianping Zhao reviewed the past two decades' experience of private power investment. As he noted, by mid-1998: (a) 34 large<sup>2</sup> projects involving private developers, with an installed capacity of over 26 gigawatts (GW), were operational or under construction; and (b) 25 power companies, with an installed capacity exceeding 12 GW, were listed on domestic and foreign markets. By any accounts, this is a great achievement in a country where private investment has been legal for less than five years, noted Yukon Huang in his introductory remarks.

Private investors have been involved in developing power projects through three main methods:

- Joint ventures (JVs),
- Initial public offerings (IPOs) on stock exchanges, and
- BOT agreements.

This diversified approach has helped the whole investment program to be successful since it allowed investors to adapt their corporate strategies to the particular problems and

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<sup>2</sup> The number of small (less than 100 megawatts, MW) projects is estimated at about 200 projects with an installed capacity of about 6,000 MW.



difficulties encountered in different parts of China and to choose the most appropriate risk mitigation methods, noted Yoshihiko Sumi, Sector Director, East Asia Energy and Mining Development Sector of the World Bank.

By far, the vast majority of private power investments (amounting to about US\$15 billion) in China have been JV agreements to develop greenfield projects with limited-recourse financing.<sup>3</sup> One of the most successful investments was the Zhuhai (2x700 MW) coal-fired plant that is nearing commercial operation. Experience with Zhuhai and other JV limited-recourse projects indicates that the key factors for a success include proper allocation and sharing of risks among parties, strong commitment of local partners, and identification of development and financing conditions (Box 1). All these help to overcome difficulties due to complicated and lengthy requirements in the approval process and gaps in the legal and regulatory framework.

#### **BOX 1: ZHUHAI JOINT VENTURE AND LIMITED-RECOURSE FINANCING**

The Zhuhai 2x700 MW coal-fired plant, sponsored by Cheung Kong of Hong Kong, was the first JV project utilizing limited-recourse financing in China to be financed without a multilateral or government guarantee. The initial JV was signed in 1993, reaching financial closure in 1996, with commissioning of the second unit by mid-2000. The total JV period is 20 years, with a total of six units (total capacity of 4,200 MW) planned.

For the first phase (2x700 MW), the total project cost is about US\$1.23 billion, of which 30 percent is shareholders' equity. The remaining financing includes US\$670 million in export credit from the Bank of Tokyo Mitsubishi, US\$126 million in commercial loans, and Y 500 million in local financing. Key factors in closing the project included not only JEXIM participation but also letters of support from the government and equitable risk allocation. The success of the project is also attributable to proper documentation for tariff adjustments, clearly stated roles and well-defined tasks, and clear communication among all players.

*Source:* Study team.

Eric Kwan, Chief Executive Officer of China Infrastructure of Cheung Kong Infrastructure Holdings Limited, noted and most of the participants (especially the foreign investors) agreed that JVs will continue to be a successful and preferred approach for power project development and financing. He stressed the importance of the Chinese JV partner in building consensus of the Chinese authorities around the project and in managing the many steps required for implementing it. The success of this approach was confirmed when the closure of the Shandong loan syndication for US\$2.2 billion in late 1998 raised capital for over 3,000 MW of power plants (Box 2).

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<sup>3</sup> Unlike some BOTs, where the most common approach for selection of the investor is international competitive bidding, JV agreements have often been concluded through negotiation, although competitive tendering is also possible and increasingly employed.

**BOX 2: SHANDONG ASSET SECURITIZATION**

A large loan syndication of Shandong Zhonghua Power Company, a joint venture sponsored by Shandong Electric Power Group, CLP Holdings, and EdF, was completed for the US\$2.2 billion project, with US\$1.5 billion worth of financing for 3,000 MW of generating capacity: 2,400 MW at Shiheng II, Heze II, and Liaocheng coal-fired power plants, and the acquisition of 600 MW Shineng I. The deal involved an uncovered commercial loan for US\$350 million, a US\$312 million term loan facility with 100 percent political and commercial risk coverage by the Export Credit Agency (ECA) ECGD, and an equivalent US\$822 million loan denominated in Renminbi from the China Construction Bank and Shandong CITIC. The issue was oversubscribed by 130 percent.

*Source:* Study team.

Second, IPO listings have raised almost US\$2 billion in equity investment in the Chinese power sector through international and domestic listings. Despite the Asian crisis and subsequent stock market volatility, most have performed well. According to Yang Hongming, Executive Director of the Beijing Datang Power Generation Company, this can be attributed to the listing of only strong, well-managed companies, the selection of the best-performing assets, the strong interaction with market players, and the focus on the international business concept of building shareholder value (Box 3). The ongoing success of IPO is demonstrated by the pending listing of Shandong International Power Development, which will make a bid to list at about US\$300 million in Hong Kong.

**BOX 3: BEIJING DATANG IPO**

Five major investment firms, Warburg Dillion Read, ING-Barings, ABN-AMRO, and Donaldson, Lufkin & Jenrette, have all made recommendations in 1999 supporting investment in the three publicly traded power companies with access to foreign capital. Beijing Datang, one of these three, is a joint stock company that first traded H shares on the Hong Kong stock exchange and London Exchange in March of 1997, raising about Y 3.7 billion (US\$440 million).

Beijing Datang's output from its four plants in Hebei and Beijing has continued to grow, with expected growth to continue through 1999. Its principal market is the North China power grid where demand has remained strong and utilization rates continued at about 5,500 hours. The company plans to continue development of large coal-fired plants, greater than 300 MW. The capacity is expected to expand by 9.6 percent in 1999 and by 7.5 percent in 2000. Earnings are expected to increase by about 20 percent in 1999 and 35 percent in 2000.

Datang has several competitive advantages. It is a low-cost producer with 70 percent of its on-grid tariff price the lowest sold into the Beijing-Tianjin-Tanghan power grid. Another major advantage for the company is its strong balance sheet with low debt, strong cash flow, net cash position of Y 700 million, and a management philosophy that emphasizes increasing shareholder value.

*Source:* Study team.

Last, China was one of the first countries to implement the BOT model in the mid-1980s. The successful Shajiao-B plant (2 x 350 MW) in Guangdong was the first large private power project to be put into operation. However, some reservations emerged

about the effectiveness of the negotiated contracting procedures and the government moved to a competitive approach for subsequent BOT projects. China's first competitively tendered BOT in the power sector was Laibin-B. (Box 4). The widely acclaimed success of this project, noted Kevin Wall, Managing Director of Investment Banking of Barclays, can be attributed to a number of factors, most notably a formal letter of support from the State Development and Planning Commission (SDPC), transparency of the development process, tight adherence by the government to the announced implementation schedule and procedures, and a financeable allocation of risk among key partners. Replicating this success may be difficult for later projects given the high visibility and level of support and attention this first project was given by the government. Future projects may not have the same level of government support, thereby increasing the need to rely on offtaker creditworthiness.

#### **BOX 4: LAIBIN-B BOT**

Laibin-B was the first BOT project, selected through competitive bidding, formally approved by SDPC. It is considered a model for future projects in China. The project includes 2x360 MW coal-fired power station in Guangxi Province for a concession period of 18 years, (operation of 15 years), and a total cost of US\$616 million. Total equity was US\$154 million (25 percent), with commercial debt of US\$159 million and a COFACE loan of US\$303 million, including a \$120 million standby and contingency facility.

EDF and GEC Alstom, the sponsors, won through international competitive tendering with financial closure less than two years after the issuance of tender documents. The project fulfilled multiple goals: for the government of using limited public sector capital and promoting transfer of technology; and for investors of maximizing returns and using services and experience of the sponsors. Key success factors include establishment of the BOT legal framework, availability of government support via SDPC, ECA participation and favorable terms, allocation of foreign exchange to service the debt, clear tariff approval process, and provincial government credit.

*Source:* Study team.

#### **Lessons Learned from the Crisis in Southeast Asia**

A number of countries in Southeast Asia have embarked on ambitious independent power producer (IPP) programs to respond to the power shortages appearing in the early 1990s and the financing requirements of rapidly growing demand. Discussion at the conference focused on two example countries, Indonesia and Thailand. Both countries developed their programs by providing private developers with traditional long-term power purchase agreements (PPAs) with the national electric utilities, the sole purchasers of power from IPPs. Both national utilities had expectations of recovering the cost of power supply through tariff adjustments. In both countries, the long-term PPAs include take-or-pay capacity payment obligations and foreign exchange indexation that place the market risk (the demand for power and revenue receipts from consumers) and foreign exchange risk (rising domestic currency costs due to devaluation of the currency)

on the purchasing utilities, with the cost consequences of such risks expected to be passed through to captive customers.

With the onset of the Asian crisis, the IPP programs in both countries ran into severe difficulties. In the Indonesian power sector, the problems were, and continue to be, particularly dramatic and coincided with a period of political and social uncertainty. Yet even before the crisis, there was significant overcapacity. Five main factors were stressed by Ray Tomkins, Managing Director of Economic Consulting Associates Limited, in his presentation. First, the tariffs in the PPAs were not competitively determined. They were established through negotiation between PLN (the national electric utility) and project companies including consortium partner companies owned by, or with close links to, companies associated with high government officials. This resulted in PLN being pressured to enter into PPAs with tariffs in the range 6 to 8 US cents/kilowatt-hour — kWh (the highest is around 10 US cents/kWh), far higher than PLN's current retail tariff rates of about 3 US cents/kWh versus 6-8 US cents/kWh before the collapse of the Rupiah. Prices in most of the PPAs are fully indexed to the US dollar. The second problem has been the collapse of the currency, which fell from around Rp 2,500 per US\$1 to over Rp 16,000 at the height of the crisis, before recovering to its current level of around Rp 7,500 per US\$1. PLN's current tariff in dollar terms is under 3 US cents/kWh. Third, economic dispatch is restricted since over 55 percent of the installed capacity of the Indonesian power sector is now subject to long-term inflexible contracts (geothermal plants are must-run, PPAs have take-or-pay capacity obligations, and take-or-pay gas contracts). Fourth, the projects appeared to foreign investors to have the character of a JV due to the involvement of companies sponsored by government officials but the weak letters of support issued by the Government of Indonesia may not be enforceable. Finally, following the economic turmoil, the need for power dropped significantly, such that none of the new IPPs under development are needed soon—yet PLN will remain obligated to make the capacity payments.

It is not politically or socially possible to increase power tariffs to cover these additional costs in the short term. As a result, PLN's ability to remain financially viable depends heavily on continuing large subsidies from the government. The government has instructed PLN to reach renegotiated settlements to these contracts but has also attempted to address this by suspending certain contracts notwithstanding their terms.<sup>4</sup> This response is unlikely to prevail as the Indonesian government recently lost a US\$500 million arbitration award in which the arbitrator concluded that the Indonesian government was not entitled to take such unilateral action. As a result, the most likely

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<sup>4</sup> PLN has also announced that it will not operate IPP plants that are due to come into operation in the next two years, and has also delayed or suspended payments due under the PPAs or is paying at a notional pre-crisis exchange rate of Rp 2,450 per US\$1. International credit rating agencies have recently severely downgraded the debt rating of the Paiton 1 project, which is a large coal-fired plant and the next IPP due to be completed in 1999.

consequence will be a financially insolvent utility and protracted renegotiation (for at least two years) of all of the PPAs.

The Asian crisis has had a similar, but less dramatic, effect on the Thai power sector. Unlike Indonesia, the tariffs for IPPs were established through a very competitive power solicitation. Even with the indices for foreign exchange adjustment eventually included in the PPAs, the tariffs for gas and coal projects were approximately 3.3 US cents/kWh and 4.3 US cents/kWh, respectively. In addition, the foreign exchange risk was not a 100 percent pass-through to the Thai purchasing utility (Electricity Generation Authority of Thailand, EGAT). Instead, the exchange indices adjusted a percentage of the capacity payment based upon the amount of costs that could be legitimately expected to be procured from foreign sources. The initial success of this program, indicated Rob Fitzgibbons, Advisor to EGAT, in his presentation, can be attributed to a well-defined legal system and project approval process, the broad-based support for the IPP program generally, the attractive tariffs that resulted from the competitive tender process, the long period of sustained economic growth that predated the competitive solicitation, the financial community's confidence in the financial viability of EGAT as the power purchaser, and EGAT's willingness to enter into long-term PPAs that allocated project and market risk in a manner that met what at the time were the international standards for limited-recourse financing.

Nonetheless, as in Indonesia, the Asian crisis and the allocation of market risk to EGAT through long-term PPAs is creating significant problems for the power sector in Thailand. If all seven IPPs that have executed PPAs with EGAT obtain financing, the power sector will have excessive reserve margins throughout much of the next decade. This overcapacity and the cost of the take-or-pay obligation will be politically difficult to pass on to consumers notwithstanding the broad-based support for the IPP program that existed prior to the advent of the Asian crisis. Although such costs may not have as severe a consequence on EGAT as with PLN, it will still create a severe financial strain on the operation of the Thai power sector. To address this situation, EGAT has already conducted one round of renegotiation of the PPAs to delay the five IPPs that have not yet achieved financial closure and an additional round of renegotiation is expected in the future.

Finally, the governments of both Indonesia and Thailand have initiated efforts to reform their power sectors to introduce a single buyer model and some competition between generators. If such reforms are implemented, it is unlikely that PLN or EGAT will execute any further long-term contracts with IPPs. In both cases, new trading mechanisms will need to be found to accommodate the existing PPAs within the operation of the competitive generation markets.

In summary, although different in many ways, both Indonesia and Thailand demonstrate the weaknesses of the traditional long-term PPAs premised upon the single

purchasing agent model and inappropriate allocation of risk. First, the success of this model is dependent on the financial strength of the purchasing utility and the sensitivity of that strength to market risk. Second, the success of this model depends upon effective regulation to discipline the purchasing decision of the purchasing utility. Since the single buyer is expected to be permitted to pass all its costs onto consumers, it has poor in-built incentives to minimize the cost of new generation investment. Finally, the inflexibility of long-term take-or-pay contracts (often with take-or-pay fuel supply obligations) restricts the ability of the utility to dispatch the generating plant in the most efficient way.

As a result, perhaps the most important lesson to be learned from Indonesia and Thailand is that the long-term viability of IPP projects cannot be determined solely by the quality of its preparation and the strength of the PPA. Investors must look through the PPA to the fundamentals of the macroeconomic situation and the viability of the whole power sector and seek an equitable agreement with respect to allocation of risks as stressed by Jean-Paul Pinard, Associate Director, International Finance Corporation (IFC).

### **Impact of the Asian Crisis on the Chinese Power Sector**

China is obviously in a very different situation to the rest of Asia. The Renminbi is stable, tariffs are more reflective of costs and China has been more careful in its reliance on foreign-funded IPPs.

Nonetheless, the Asian crisis is having an indirect effect on foreign-financed IPPs. First, there is obviously less enthusiasm for investing and funding power projects in Asia generally. This reduced liquidity will constrain financing available for projects in China and increase its cost. In addition, the Asian crisis has affected China by increasing project developers' and foreign financial institutions' sensitivity to certain project risks, including unilateral reforms of the power sector and abrogation of contracts. As a result, power developers and international financiers are more closely analyzing power project risks.

Private investors and financiers indicated at many occasions during the conference that the Chinese could mitigate some of the effects of the Asian crisis and enhance the attractiveness of the power sector to potential foreign investors through a number of measures. These included clear articulation of a policy in support of the sanctity of contracts, the accelerated development of a national transmission grid, improved transparency and a simplified approval process, creation of a more independent framework for regulation, greater assurance in the adjustment of tariffs to reflect costs, and increased transparency in the accounts of the power supply bureaus.

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## Competitive Market Reforms and Private Sector Involvement

Following the enactment of the Electricity Law, the Chinese government has shown strong commitment to reforms aiming at easing new entry at the generation level, separating ownership and commercial functions from government policy and regulatory functions, gradually developing a legal and regulatory framework, and promoting private sector investments. The success of the initial reforms is demonstrated by the alleviation of the acute power shortages of the late 1980s/early 1990s, the encouraging development of private power and the increased commercial orientation of the sector.

However, as strongly stated by Xu Songda, Deputy General Manager of Jiangsu Provincial Electric Power Company, the slowdown of demand growth in 1997/98 revealed the limits of the single buyer model and the “new plant, new price” policy that stipulates that tariffs should permit recovery of operation costs, repayment of debt and taxes with reasonable profits. The short-term maturities of loans, especially domestic ones, require recovery of capital costs over a period of 8 to 12 years, resulting in front-loading of power tariffs, particularly when exacerbated by the slowdown of demand growth. The mismatch between loan maturity and the economic life of the assets led to very high prices in the early years of operation of the projects and the one-part tariff structure used in some contracts led to nonoptimal dispatch and important efficiency losses. Faced with the slowdown of power demand and “take-or-pay” clauses of the PPAs, provincial power companies voiced concerns about solely bearing the full market risk.

To address these issues, the Chinese authorities are considering how to further develop the reform process by gradually moving toward wholesale and possibly, in the longer term, retail competition. Regulations have already been issued by the State Council for full separation of generation from transmission and distribution in all provinces. Plants will initially be given a two-part contract (capacity and energy components), thus replacing the minimum dispatch obligation with an available capacity payment and allowing economic dispatch to be fully implemented. At the next step, these contracts will be replaced by flexible “contracts for differences” to allow the plants to bid for dispatch to establish a common clearing price (“pool price”) for generation although all the power will continue to be sold to the provincial power companies (single buyers) and the majority of generators’ revenue will still be assured through the contracts for differences. The market risk will initially remain with the single buyer with a small portion being borne by the power plants. In the second stage, the contracts for differences will be assigned to distribution companies and the proportion of power purchased covered by them reduced, so that the market risk will be shared between the distributors and the power plants, with the grid company (formerly the single buyer) no longer bearing any market risk. Wholesale competition, in which generators may contract directly with large consumers is the next stage. Retail competition, the last stage in which all consumers will

have a choice of suppliers, could take another 10 years and will be dependent upon prevailing economic conditions and management skills at the provincial level.

Several developers expressed concerns that a premature move toward competitive markets without establishment of a credible and predictable regulatory framework and clarification and streamlining of administrative procedures could increase the risks related to project development. This could jeopardize the progress achieved to date, mainly based on long-term contracts.

Responding to these concerns, both Shi Yubo, Director of Electric Power Development at the State Economic and Trade Commission (SETC), and Xie Songlin, Chief Accountant of SP, indicated that the implementation of the new wave of reforms will be kept under review in the light of the experiences gained from the pilot provinces now developing competitive markets. They stressed that past contractual arrangements will be honored, and noted the expressed requirement of developers to have contracts (possibly of a different type) to help secure financing of new projects.

In order to judge the pace and scope of potential reform measures for China, six pilot provinces were selected to proceed with increased competition at the generation level. Zhao Hubin, Deputy General Manager of Zhejiang Provincial Electric Power Company presented Zhejiang's reform program, which will be the first test case. Zhejiang is seeking to unbundle power markets to increase competition and reduce supply costs. Differential tariffs are seen as a way of minimizing risk for generators during the transition period. Initial trials of the new market are expected in 2000. A future step will be to gradually allow the distribution companies and large consumers to contract for purchase directly from generators. This will shift the market risk on to the distributors. As pointed out by Diana Gan of ABN-AMRO, both investors and lenders would expect considerable improvement in the transparency of the distributors' accounts in order to be able to assess the risks of these new contracts.

Developers were not so much concerned with the direction of reform, but with having a transparent process and schedule for implementing reforms so that the consequences of such reforms can be assessed during the development and structuring of projects. In addition, power project developers emphasized the need for clear rules to be able to assess the impact of reforms on existing projects and their PPAs, including those that might be signed between now and when the reforms are introduced. The developers' concerns about the impact of future reforms lessened following the emphasis put by Chinese decisionmakers on the lengthy transition period that will be required for such reforms based upon international experience (e.g., the United Kingdom has already taken 10 years and its market is still evolving). Lastly, it was consistently stressed that the sanctity of existing contracts (which does not preclude freely negotiated changes to those contracts) should be preserved during the transition to a competitive market.



In a discussion on the impact of the reform and the aim to shift more market risk onto IPP developers, both Ian Parker of National Power and George Grant of InterGen (who were the first to develop a merchant power plant project in the United Kingdom)<sup>5</sup> stressed that merchant power plants are still a long way off for China. But there was optimism that China would succeed with its reform process and ultimately reach a competitive market through its gradual approach.

### **Actions to Promote Private Sector Investment**

Throughout the conference there was general agreement that, despite the heightened risk awareness, JVs with limited-recourse financing will remain a dominant option for power projects in China. BOTs (fully foreign-owned in China) will be further developed, but many developers expressed their continuing preference for the JV approach. The main concerns expressed by project developers and international financial institutions included the following.

**Project Approval Process.** All developers agreed that the project approval process must be clear, unambiguous, transparent and, if possible, more streamlined. In response to this concern, a number of the Chinese officials stressed that the approval process is fair because it is identical for domestic and foreign projects. While they recognize that the process is lengthy and involves many institutions, it is transparent (as indicated in several presentations) and contributed to minimize the problems faced by the sector compared to other countries. It will certainly be streamlined with the progress of the country toward a socialist market economy.

**Tariff Approval and Adjustment Process.** Concerns were raised about the tariff approval and adjustment process. First, there was a concern that it takes too long to obtain initial tariff approval and subsequent annual adjustments. Second, certain developers and financial institutions expressed concern about the cost-plus approach to reviewing tariffs and the requirement to have such tariffs approved on an annual basis. Project developers and international financiers also echoed concerns regarding the transparency of the review process given some recent problems, highlighting an urgent need for detailed implementation regulations to provide more assurances to financiers and developers and assist provincial regulators. Developers generally agreed that there is an urgent need for a transparent and well-defined regulatory regime for determining tariffs. Chinese officials emphasized the need for developers to follow Chinese regulations regarding tariffs. They stressed that emerging problems stem from the developers' reliance on approvals and

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<sup>5</sup> A merchant power plant is one in which the investment is committed without having long-term contracts in place. InterGen's project was implemented after nearly 10 years' experience of the operation of a competitive pool in England and Wales. However, it should be noted that even though no power offtake contracts were in place when construction commenced, the plant will aim to sign a number of contracts with consumers before it comes into operation.

assurances given by local authorities, who sometimes went beyond their decision-making power.

**Creditworthiness of the Offtaker.** Many conference participants agreed that the Asian crisis, coupled with the Chinese government's expressed intent not to issue any more letters of support, had increased investor concerns about project fundamentals and stressed that the financial strength of the offtaker becomes fundamental to project financing. The assessment of offtakers' financial conditions in China is hampered by the difficult access to their accounts and their noncompliance with international accounting standards. There is an urgent need to address these issues, particularly as the reform process moves forward. In addition, several participants, especially World Bank representatives, noted that market risks of power projects could be better allocated only if project developers would be given direct access to customers. Two elements of the power sector reform reported by the Chinese speakers respond to this concern. First, commercialization of the provincial power companies should result in better financial information about offtakers. Second, separation of generation, transmission and distribution should eventually result in open markets that will allow generation companies to directly sell to industrial customers and distribution companies.

**Contractual Compliance and Enforceability.** A small number of the developers attending the conference stated that their PPAs were not being fully honored and expressed concern that they do not have an effective mechanism for enforcing their rights under existing contracts. In particular, power project developers are worried that provincial power companies will not honor their minimum dispatch obligations. The Chinese representatives recognized the investors' and lenders' concerns, although they ideally would like contracts to be shorter and provide for more balanced sharing of market risks. Some participants noted that extending the length of the BOT franchise period and even moving toward Build-Operate-Own (BOO) arrangements could give more assurance to achieving acceptable returns while spreading the capital recovery over a longer period.

**Foreign Exchange Risk and Renminbi Financing.** Several developers highlighted the importance of developing mechanisms for hedging against foreign exchange risk. In this regard, both developers and Chinese speakers emphasized the value of developing mechanisms for raising Renminbi financing for power projects. It was pointed out that Renminbi financing not only provides a means to reduce foreign exchange exposure for power projects, but also provided an opportunity to attract more domestic private funds to the sector through foreign/domestic private JVs. However, the Renminbi capital markets are currently too thin and will need time to expand.

**Clear and Transparent Regulation.** Many speakers commented that clear, transparent and predictable regulation of the power sector is imperative for lowering project development risks and will become increasingly important as the availability of

“iron clad” long-term contracts diminishes. As more competition is introduced into the power sector and developers are being asked to assume more risk, they will need to rely on well-defined rules for the approval process (of projects and tariffs, as noted earlier), access to transmission, and access to customers. Developers will need confidence that the regulatory process has sufficient independence to protect their competitive position and commercial interests.

### **Conclusions and Priorities for Future Reforms**

In his concluding remarks, James Bond, Director of the Energy, Mining and Telecommunications Department of the World Bank, summarized the outcome of the conference in seven points.

First, the consensus of all participants at the conference is that, notwithstanding the Asian crisis and diminished liquidity in financing, private capital can still make an important contribution to financing power sector infrastructure in China. However, to access such financing, it is important to continue strengthening China’s investment climate for competing with other borrowers in the international financing markets and keeping the risk-to-return ratio for power projects in China comparable to similar investments elsewhere in the world.

Second, all participants agreed that risks associated with power projects in China can be reduced by ensuring transparency, predictability and clarity in the regulatory process for project development, including the process for project and tariff approvals. China should continue to push forward with its efforts to develop a strong and independent regulatory structure.

Third, the Asian crisis has demonstrated that although PPAs are important, project developers and financiers must look beyond PPAs and focus on the economic fundamentals of the individual power projects, the offtaker’s creditworthiness and the viability of the entire power market.

Fourth, the Asian crisis and reforms underway will demand changes to the way projects are financed. Additional measures must be developed to hedge against project, currency and market risk and ensure that risks must be allocated as equitably as possible. Currency risk can be reduced by broadening the Renminbi markets and making more Renminbi available for investment. Ultimately, equitable sharing of market risk will require power generators to obtain direct access to consumers. This indicates that reform of the distribution sector should not be allowed to lag too far behind reform of generation.

Fifth, China remains a tremendously exciting market for investments in power projects due to its size, growth potential and commitment on the part of the Chinese government to further liberalization of the power sector. The participation of private investors can also be expanded in other areas. Recent experience in Latin American

countries and in India shows that China could attract more domestic and foreign private funds if it provides incentives for investments in renewable energy, especially wind, and allows access to other segments of the industry, especially distribution.

Sixth, it is evident that the legacy of a planned economy remains present in the comprehensive manner in which power projects are approved. Nonetheless, reforms are already under way that will further liberalize the power sector, introduce competition, and thereby further improve the prospects for private participation in the Chinese power sector. These reforms include the separation of generation assets from transmission and distribution, the introduction of competitive power markets, the commercialization of power companies, further tariff reforms and continuation of the development of an transparent and effective legal and regulatory framework for the power sector. In the long term, these reforms will dramatically improve the economics and efficiency of the sector.

Seventh, the discussions at the conference clearly highlighted the ways of encouraging the power sector to benefit fully from private participation and financing. Priority should be given to the following reforms: (a) the implementation of further power sector reforms in a transparent process, where the scope, direction and schedule of reform can be assessed by potential investors in the Chinese power sector; (b) clarification and streamlining of the process for obtaining power project and tariff approvals; (c) development of mechanisms for and increased access to Renminbi financing for all power projects; (d) the separation of generation from the transmission networks; (e) commercialization of the various power companies that will be offtakers from private power projects; and (f) provision to power developers of direct access to customers so that they are able to bear more market risk in the future.

## CONFERENCE AGENDA

*(Beijing, June 22-23, 1999)*

*Sponsored by the Ministry of Finance and the World Bank*

### *Day One, June 22 (Tuesday)*

**8:30 Registration**

**9:00-9:20 Opening Ceremony**

- **Welcome and Opening Remarks**

*Yukon Huang, China Country Director, The World Bank*

*Zhu Guangyao, Director-General, International Department, Ministry of Finance*

**9:20-9:40 Introductory Session**

- **China's Macroeconomic Policy and the Stability of the Renminbi**

*Li Ruogu, Director General, International Department, People's Bank of China*

**9:40-10:00 Brief Q&A Session**

### SESSION A

**10:00-11:00 Recent Experience in the Chinese Power Sector**

*Chairman: Yoshihiko Sumi, Sector Director, EASEG, The World Bank*

- **Current Status of Private Power in China**

*Zhao Jianping, The World Bank*

- **Joint Venture and Use of Limited-Recourse Financing: Case Study**

*Eric Kwan, CEO, China Infrastructure, Cheung Hong Infrastructure*

**11:00-11:15 Tea and Coffee Break**

**11:15-12:15 Recent Experience in the Chinese Power Sector (continued)**

- **BOT Model: Success of Laibin B**

*Kevin Wall, Barclays Bank*

*Dominique Prat, EDF*

- **IPO Listings: Case Study of Beijing Datang Power Generation Company**

*Yang Hongming, Executive Director, Datang Power Generation Company*

**12:15-13:30 Lunch**

**13:30-15:15 Roundtable Discussion: Assessing Appropriate Financing Options**  
*Chairman: Cai Jinyong, CICC*  
*Rapporteur: Dean Girdis, The World Bank*  
*Participants: Jean-Paul Pinard (IFC), Thomas Wu (AES), Diana Gan (ABN-AMRO)*

**15:15-15:30 Tea and Coffee Break**

### SESSION B

**15:30-17:30 Impact of the Asian Crisis on Power Sector In Asia**  
*Chairman: James Bond, Director, EMT, The World Bank*

- **Indonesia: Lessons From Experience**  
*Ray Tomkins, Independent Consultant*
- **Thailand: Lessons From Experience**  
*Rob Fitzgibbons, Independent Consultant*
- **Understanding the Effects of the Asian Economic Crisis and its Ramifications on Investment in China: Opportunity or Cause for Flight**  
*Joseph Ferrigno, President and CEO, Prudential Asia Infrastructure Investors*
- **Discussion**

**17:30-19:00 Cocktail (hosted by The World Bank)**

### *Day Two, June 23 (Wednesday)*

**8:30-10:00 Prospects for Private Power Investment in China after the Asian Crisis**  
*Chairman: Yang Qing, Deputy Director, Investment and Financing Dept., SP*

- **Power Demand Outlook: Are Markets Still Attractive?**  
*Wang Xingmao, Director, Economic Research Center, SP*
- **Changes in Project Risk Profile**  
*Eugene Lu, Chief Representative of Shanghai Office, Sidley and Austin*
- **Discussion**

**10:00-10:15 Tea And Coffee Break**

**10:15-12:00 Roundtable Discussion: Opportunities for Power Investment in China: Long-Lasting Impact or Short-Term Crisis?**  
*Chairman: Dr. Y.B. Lee, Managing Director, CLP-PC*  
*Rapporteur: Rob Fitzgibbons, Consultant*  
*Participants: Crag Chapman (SITHE), Yang Qing (SP), Xu Songda (JPEPC)*

**12:00-13:30 Lunch**

### **Session C**

**13:30-15:30 Reform Initiatives by Government to Promote Investment**  
*Chairman: Tan Aixing, Counsel, SP*

- **Pricing Issues**  
*Bai Jianhua, Economic Research Center, SP*
- **The Unbundling of Provincial Power Companies and Introduction of Competition**  
*Xie Songlin, Deputy General Manager, SP*  
*Zhao Hubin, Deputy General Manager, ZPEPC*
- **Project Approval Process**  
*Liu Hongkuan, Deputy Chief of Foreign Investment Division, SDPC*
- **Power Sector Regulation**  
*Shi Yubo, Director of Electric Power Department, SETC*
- **Discussion**

**15:30-15:45 Tea And Coffee Break**

**15:45-17:00 Roundtable Discussion: How Will Reform Affect the Ability of the Sector to Finance Investment?**  
*Chairman: Yoshihiko Sumi, Sector Director, EASEG, The World Bank*  
*Rapporteur: Ray Tomkins, Consultant*  
*Participants: Ian Parker (National Power), V. Mastilovic (AIMAC), George Grant (InterGen)*

**17:00-17:30 Closing Remarks**  
*James Bond, Director, EMT, the World Bank*

**17:30-18:30 Cocktail (hosted by the Ministry of Finance)**

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**PART TWO: PRIVATE POWER DEVELOPMENT IN CHINA:  
THE 1,000-MILE JOURNEY**

Jianping Zhao

*"A 1,000-mile journey  
begins with a first step."*  
Chinese saying

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## INTRODUCTION

The purpose of this paper is to consolidate available information on private power development and assess the present status and future prospects for private sector involvement.

*Chapter 1* gives a brief overview of power development potential and investment requirements for the next decade and beyond. It also notes the dramatic shift that has taken place in the pattern of financing from centralized government budget allocations to decentralized joint investment ventures involving local authorities. These initiatives have helped to create opportunities for private investment during the past 15 years and bring about legal and administrative framework.

*Chapter 2* describes the process of how private sector participation in power has developed historically. It outlines the key characteristics and indicates some future developments for the two main forms of private sector participation that have emerged in China: public and private sector investment partnerships; and the divestiture of government assets in power companies by listings on domestic and international stock markets.

*Chapter 3* presents the legal and administrative framework that governs the type of power development activities that Chapter 2 describes. It serves as a reference guide for key laws, regulations, and approval procedures. It also describes the proposed regulations for Build-Operate-Transfer schemes, which the existing framework does not adequately cover, and cites areas of the sector framework that require improvement.

*Chapter 4* provides a preliminary assessment of some key concerns that private investors are likely to have when considering investment in China's electric power development, taking account of the discussions in the previous three chapters. The areas covered are: the impact of the Asian economic crisis, potential foreign exchange risk, tariff policies and procedures, rate-of-return regulation, the project approval process, and guarantees available to private investors.



## CHAPTER 1. THE SCOPE FOR PRIVATE INVESTMENT IN THE WORLD'S SECOND-LARGEST POWER SECTOR

### HIGHLIGHTS

- ❖ There is considerable scope for private investment in China's power sector due to China's relatively robust economic growth; power system expansion as a priority government objective; the decentralization of responsibility for financing power development; and increasing openness to private sector participation.
- ❖ China has one of the fastest growing economies in the world and with over 1.2 billion people it has potentially the world's largest consumer market.
- ❖ China's power system is already the second-largest system in the world and there is significant room for further development based on per capita consumption figures in China and industrialized economies. Forecasts indicate that it would have the largest power system in the world during 2015-25 depending on growth scenarios.
- ❖ In addition to power system capacity expansion, the country's planned modernization of existing power facilities is likely to create further private investment opportunities.

### High Economic Growth

China is becoming an increasingly attractive option for private investors in electric power development for several reasons. First, despite recent economic setbacks in Asia, the country's economic growth had been relatively strong, especially compared to other Asian economies. Second, the Government of China (GOC) is giving high priority to power system expansion. Third, to achieve the necessary expansion, China has made considerable progress in promoting commercialization of the power system and developing a viable framework for private sector participation.

During the past decade, China's economic growth in real terms has been about 10 percent per year, one of the highest in the world. With over 1.2 billion people, China has potentially the world's largest consumer market.<sup>1</sup> Despite more than a decade of rapid

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<sup>1</sup> Shou Qing Wang, R.L.K. Wang, Seng Kiong Ting, David Chew, and David Ashly, "Evaluation and Competitive Tendering of BT Power Plant Project in China," *Journal of Construction Engineering and Management*, July/August 1998.

growth, China's power system, already the second-largest in the world, still has an enormous growth potential and is relatively underdeveloped compared to industrialized market economies.

### Power System Growth and Development Potential

The total installed power generation capacity in China increased from 66 Gigawatts (GW) in 1980 to about 277 GW in 1998, at an average growth of about 9 percent per year. However, China's per capita electricity consumption remains considerably lower than that of most industrialized nations. For example it is only about 6 percent that of the United States. To give an idea of potential development, an increase in system capacity to reach 1 kilowatt (kW) installed per person—only a third of the per capita system capacity in the United States—would mean a total installed capacity of 1,200 GW or more than four times China's current capacity.

Chinese authorities estimate that additions to China's power system capacity will increase from an annual average of 16.7 GW during 1997-2000 to around 22-28 GW between 2000 and 2010 (Table 1.1). The system growth rate during 1980-97 was 8.5 percent. The estimated growth rate for 1997-2010 is 6.5 percent, two percentage points below the rate for 1980-90 but still considerable by world standards (Figure 1.1). At this rate, according to forecasts, between 1997 and 2010, China's total generating capacity would more than double. By 2015 China would have the largest power sector in the world. If the system grows at the lower rate of 5 percent, China would have the largest system only a few years later, by 2019. Yet even with this major growth, China's installed capacity per person would still be significantly below that of industrialized nations such as Japan and the United States.

**TABLE 1.1: CHINA'S ELECTRICITY FORECAST (1990-2010)**

Year	1997	2000	2005	2010
Electricity demand (TWh)	1,135	1,400	1,870	2,500
Installed capacity (GW)	250	300	410	550
Average additional capacity per year (GW)		16.7	22	28

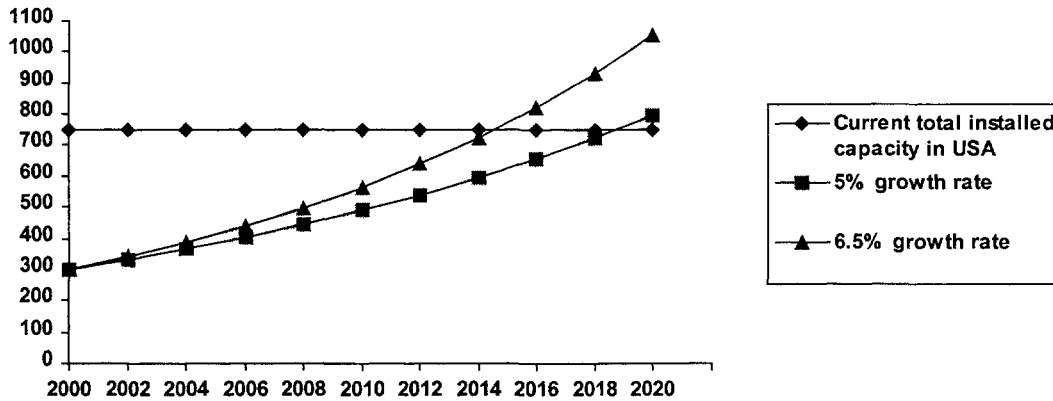
Source: Study team.

### Modernization of Generating Facilities

China's development plans are emphasizing the modernization of the country's power industry as a key aspect of development. This includes not only incremental capacity additions but the replacement of existing capacity for greater generation efficiency. For example, the current plan (1996-2000) calls for the installation of progressively larger generation units (200-600 megawatts—MW) to achieve greater economies of scale. In response to this plan, the country is modernizing and expanding its existing domestic manufacturing capabilities to produce 300-MW units. It is also

developing the capability to produce 600-MW units. In addition, China is importing state-of-the-art generating equipment to meet about 25-30 percent of its new generating equipment needs and is receiving bilateral and multilateral loans to finance these imports.

**FIGURE 1.1: EXPECTED INCREASE OF INSTALLED CAPACITY IN GW**



Source: Study team.

China has made some progress in improving generation efficiency. However, about half of China's installed thermal generation capacity still consists of inefficient units of 125 MW and below. The delay in switching is due mainly to the reluctance of GOC, until recently, to decommission a large number of old and inefficient units because of persistent power shortages. In the mid-1990s these shortages were substantial, about 20 percent of demand. However, now that the supply situation has improved GOC is beginning to focus more on system efficiency improvement. For example, there are plans to decommission, by the end of 2003, all conventional thermal generating units of 50 MW and below. These units total nearly 30 GW and represent about 11 percent of total generating capacity.

The highest growth prospects in the power system are still for coal-fired facilities despite policies to diversify sources of power generation for environmental reasons. During the last planning period, the share of thermal plants increased from about 70 percent to 80 percent with a corresponding decrease in hydropower's share from about 30 percent to 20 percent. Coal-fired generating facilities accounted for some 80 percent of the 211 GW in capacity added during 1980 through 1998. The domination of coal in thermal generation is due to China's continued dependence on its enormous coal resources and strict government policies to limit the construction of oil- and gas-fired units. Recently, restrictions on using gas for power generation have been lifted by the government.

## Decentralization and Power Sector Financing

Since the mid-1980s, the gradual decentralization of the power sector has changed the composition of power system investment financing substantially (Table 1.2).

**TABLE 1.2: POWER SECTOR INVESTMENT SOURCES FOR CAPITAL CONSTRUCTION  
(1980-96)**

Source	1980	1985	1991	1996
<b>Government appropriation</b>				
Billion Yuan	2.737	3.981	0.146	0.223
<i>Percent of Total</i>	66.4	41.2	0.5	0.2
<b>Operational funds</b>				
Billion Yuan	--	--	2.223	1.539
<i>Percent of Total</i>	--	--	7.0	1.6
<b>Domestic loans</b>				
Billion Yuan	1.032	2.325	7.464	37.189
<i>Percent of Total</i>	25.0	24.0	23.6	38.2
<b>Foreign funds</b>				
Billion Yuan	--	0.488	3.436	11.373
<i>Percent of Total</i>	--	5.0	10.9	11.7
<b>Transferred to local authority</b>				
Billion Yuan	--	--	0.968	1.515
<i>Percent of Total</i>	--	--	3.0	1.5
<b>Fund raising</b>				
Billion Yuan	--	0.866	5.858	16.508
<i>Percent of total</i>	--	9.0	18.5	16.9
<b>Bonds</b>				
Billion Yuan	--	--	2.353	0.989
<i>Percent of Total</i>	--	--	7.4	1.0
<b>Self-financing</b>				
Billion Yuan	0.355	0.615	4.936	24.167
<i>Percent of Total</i>	8.6	6.4	15.7	24.8
<b>Oil to Coal Fund</b>				
Billion Yuan	--	--	1.470	1.139
<i>Percent of total</i>	--	--	4.6	1.17
<b>Other (not identified)</b>				
Billion Yuan		1.394	2.433	2.777
<i>Percent of Total</i>		14.4	7.7	2.8
<b>All Financing Sources</b>				
Billion Yuan	4.124	9.669	31.601	97.419
<i>Percent of Total</i>	100.0	100.0	100.0	100.0

Source: Study team.

Contributions from the state budget accounted for 60 percent of total power sector financing in 1986. However, by 1996 contributions from the state budget had declined to only about 2 percent, with self-financing, foreign funds and domestic loans accounting for 75 percent of total investment. Private investors are increasingly involved in developing power projects through Build-Operate-Transfer (BOT) arrangements or joint ventures (JVs). The diversification of financing is likely to expand further with more decentralization, market orientation and incentives for private foreign investors. It is also expected that part of the huge savings will be channeled to the sector within the development of financial and stock markets and the emergence of institutional investors.

## CHAPTER 2. INVOLVING THE PRIVATE SECTOR IN POWER GENERATION

### HIGHLIGHTS

- ❖ Private participation in the electric power sector is limited to generation facilities and has been developing gradually since the early 1980s.
- ❖ GOC's approach to private sector involvement has been to experiment, evaluate the results and prepare the legal framework necessary to support private participation.
- ❖ Local governments in China's new "economic zones" have been the main initiators. However, about half of China's provinces now have power projects with private foreign capital. There are currently 34 large projects either in the development or operational stage.
- ❖ Power companies have started listing themselves on the domestic market and foreign stock exchanges. All of the stock market listings and most of the private ventures are for coal-based generation.
- ❖ In most projects with private foreign capital, Chinese are the majority shareholders. However, in recent years JVs with foreign majority holdings have been increasing. Wholly foreign-owned ventures are limited to greenfield projects.
- ❖ Debt financing accounts for about 80 percent of all financing. About 65 percent of the private foreign capital comes from Hong Kong and other Asian investors.

### Key Steps and the General Approach

According to a well-known Chinese saying, "a thousand-mile journey begins with a first step." The first step toward private involvement in the power sector was triggered by the oil crises of the 1970s. Toward the end of that decade, Hong Kong's China Power and Light Co. Ltd. (China Light) was seeking to diversify its fuel mix to mitigate the impact of future oil shocks on its economy. Across the border, the Guangdong provincial government was desperately looking for investments and technologies to expand its power supply for its growing economy. Driven by complementary interests, China Light began exploring the joint development of a nuclear power plant in Guangdong Province.



The power company and the provincial government prepared a prefeasibility study and a project proposal that they submitted to the central government for approval.

Anticipating the bureaucratic problems facing project approval, the Chairman of China Light gave the provincial government, what at the time was intended to be, a generous, six-month period to secure the necessary central government approval. Guangdong's proposal surprised the central government. Numerous lengthy discussions among government agencies ensued. It took two years before the State Council approved the project proposal (1982). Another two years passed before the completion of the negotiations for the project agreements. The final signing of the joint-venture agreement in January 1985 marked the beginning of foreign direct investment in China's power sector. However, it took an additional two years to mobilize the capital and reach financial closure.

During the 1980s, the declining government state budget allocations for power projects and China's decentralization of power authority forced provincial and local governments to seek alternative sources of financing. The initial experience of China Light and the Guangdong provincial government encouraged the municipal government of Shenzhen, located in Guangdong province, to negotiate with Hopewell Holding Limited of Hong Kong for the joint development of the 700 MW Shajiao B power project. These negotiations took place in March 1984. However, in contrast with the earlier JV, this project took only a year for the parties to sign the BOT JV contract. The construction of the project began three months later with the total time for completion a record 22 months. During 1985–91 only a few other projects developed using private funds from Hong Kong.

In 1992, President Deng Xiaoping made a tour of south China, the location of the new economic zones that were to be the staging place of China's experiment with greater market orientation. During the tour, his speech on economic reform and the opening of the country to the private sector renewed the interest of international developers of power facilities. The result was the signing of more than 100 memoranda of understanding (MOUs) for private participation in generation development. However, the Central Government clearly was not ready to approve a large number of projects before developing a comprehensive legal framework for (new pilot) projects. Retrospectively, it was clearly apparent that many of the Chinese counterparts did not have the authority to sign the MOUs. The result was confusion and difficulties for the projects that proceeded without central government approval.

In 1993, the first privatization experiment took place. The Shenyang municipal government in Liaoning province took the initiative to raise nearly US\$100 million by transferring 55 percent of its ownership and management rights in an existing 2x200 MW coal-fired power plant to a private Hong Kong firm under a 20-year cooperation agreement. This initiative took place at a time when GOC considered the concept of

transferring state-owned assets to private hands a criminal act. The project never would have been possible without the support for economic reform which the President gave in his South China speech. As a pilot project, GOC put it on the fast-track approval process. The parties concluded the deal in only eight months.

In the absence of a specific legal framework for private power development, China developed a gradual, pragmatic approach to private partnerships: experiment; evaluate; and develop the necessary laws, regulations, and procedures as circumstances justified.

Table 2.1 illustrates the progression of private sector development based on the annual number of financings that closed for large JV projects. Overall, it shows a total of 34 financial closures of power projects with private foreign direct investment (FDI) since the mid-1980s. The data suggest that China's economic policy statements and the progress in the development of the legal framework have had a significant impact on the financial closures of projects with FDI. During 1984-91, financial closures averaged less than one project per year. Then, following government policy statements on economic reform and greater market orientation, closures increased to an average of three per year during 1992-94. Since 1995, when the Electricity Law was promulgated, the average annual number of closures has doubled to eight per year during 1995-97 and slowed down during 1998 because of the Asian financial crisis.

**TABLE 2.1: FINANCIAL CLOSURES FOR JV PROJECTS WITH FDI**

Year(s)	No. of Projects	Installed Capacity (MW)	Total Foreign Capital (US\$ million)
1984-91	5	3,950	4,181
1992	3	2,500	1,554
1993	4	2,200	407
1994	1	150	130
1995	5	2,350	874
1996	8	6,070	4,053
1997	6	5,220	2,491
1998	2	3,600	1,082
<b>Total</b>	<b>34</b>	<b>26,040</b>	<b>14,772</b>

Source: Study team.

### Profile of Private Sector Developments

**Overview.** By the mid-1990s, China had accumulated experience with a variety of initiatives for private sector participation, including the sale of shares in existing power plants to their staff and the sale of electricity rights to consumers. However, essentially two key vehicles for private participation have emerged.

The first vehicle is the establishment of private and public partnerships for the development of three main ventures: (a) equity JVs, in which profit-sharing is

proportional to equity participation; (b) cooperative ventures, which determine profit-sharing through contracts to operate/manage existing power plants or develop new projects (greenfield project); and (c) wholly foreign-owned ventures to develop new projects.

The second key vehicle is the divestiture of existing power generation assets through partial listing of state-owned power generation companies in domestic and foreign stock exchange markets.

**Public/Private Partnerships.** Table 2.2 summarizes the key characteristics of public/private partnerships in the power sector. There were 34 large projects (plants of 100 MW or larger) with FDI in operation or under construction by the end of 1998 (Annex 1; see Annex 2 for further detail of selected projects). Altogether these projects, including BOT schemes, totaled 26 GW of capacity, equivalent to about 10 percent of China's total installed power capacity. The total foreign capital involved in these projects amounted to US\$14.8 billion. Of this amount total debt financing accounted for US\$12.3 billion (83 percent) and equity participation for US\$2.5 billion (17 percent).

**TABLE 2.2: SELECTED CHARACTERISTICS OF LARGE PROJECTS WITH PUBLIC/PRIVATE PARTNERSHIPS**

<b>Total Capacity</b>	26 GW or about 10 percent of China's total installed capacity.
<b>Distribution by Fuel Type (No. of projects)</b>	Coal-Fired: 30 Oil-Fired: 3 Nuclear: 1 <i>Total</i> 34
<b>Shareholding Structure (%)</b>	Chinese majority owned: 55 Wholly foreign-owned: 21 Joint ventures with foreign majority: 18 Equal Chinese/foreign shares: 6 <i>Total</i> 100
<b>Geographical Distribution</b>	Located in 16 of China's 30 provinces, but concentrated in the southern and eastern regions, which account for 24 of the 34 projects.
<b>Costs and Financing</b>	Total cost of US\$14.8 billion, of which debt financing accounts for 83% and equity investment 17%.
<b>Status of Projects</b>	16 plants already in operation 18 plants under construction

Source: Study team.

Most of the plants financed by public/private partnerships are coal-fired facilities, reflecting the dominance of coal in the country's total generation mix. Although China has considerable hydropower potential, private developers have not been involved in sizable hydropower projects. They tend to take a cautious approach to involvement in these projects, given the high technical and institutional risks usually associated with the long construction period. The same reservation applies to nuclear power plants. The three oil-fired projects developed were exceptions to the central government's strict limitations

on the construction of these units. Because of their short construction time and relatively low capital requirements, the government gave them special consideration in order to reduce acute power deficits in high growth and export-oriented areas.

Chinese partners have held the major shares in most of the projects. Of the six projects that have foreign majority stockholders, three have resulted from the transfer of existing assets and the other three are greenfield projects in which foreign stockholders normally have minority shares. In recent years, projects which have 100 percent or majority foreign stockholding have been increasing. In 1996 and 1997 these types of ventures actually outnumbered those with majority Chinese ownership. Overall, the projects with foreign participation have accelerated since the enactment of the 1995 Electricity Law which explicitly governs these partnerships. As noted earlier, prior to this law, projects were governed only by general foreign investment laws, which did not provide a comprehensive framework.

More than half of the mainland provinces and municipalities have power projects with foreign private involvement. However, about 70 percent of the projects are located in the southern and eastern parts of the country. There are two main reasons for this concentration. First, the economies of the southern and eastern coastal regions are growing faster than those of the other regions, spurring the need for greater capacity expansion. Second, these regions are generally more economically advanced and in a better position to afford the full generation costs, and therefore usually higher prices associated with privately financed projects.

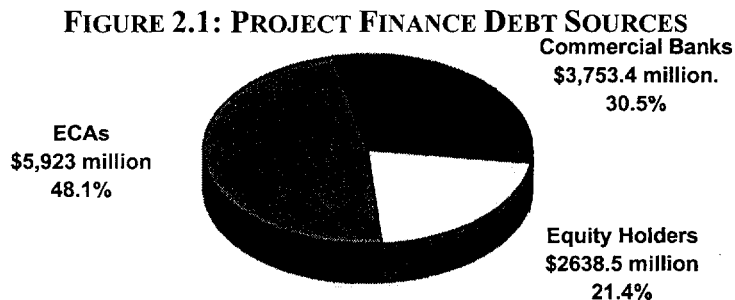
Large power projects are capital-intensive and often require more than one source of funding. Private developers usually prefer to utilize limited-recourse financing, with small equity contribution to a project company and the project company directly borrowing the remaining funds from five main sources for power project financing: commercial banks, investment banks, capital markets, institutional investors, and export credit agencies. However, without sovereign multilateral bank guarantees, it is often difficult to meet the strict criteria these institutions have for limited-recourse financing in most developing countries. Table 2.3 outlines these terms by funding source.

For more than half of the projects, limited-recourse debt financing has not been used. Instead, project sponsors borrow the funds themselves and inject them into the company developing the project. Thus, the hybrid approach (with features from both "balance sheet" financing and "limited-recourse" financing) is mainly due to the cautious approach of private financial institutions in providing direct funding for projects in China. There are 10 projects involving Export Credit Agencies (ECAs). These agencies have played a critical role in securing the success of the projects by covering an overwhelming part (85 percent in most cases) of the foreign capital needs. ECAs have provided 48 percent of the total debt financing concluded so far (Figure 2.1).

**TABLE 2.3: FINANCING TERMS AND FEATURES OF KEY DEBT FINANCING SOURCES**

Sources	Terms	Features
Export Credit Agency	2-4 years' grace 10-14 years' maturity	Typically finances 85% of the country exports, plus 15% to cover local costs, interest during construction and financing fees. Security will be taken strictly <i>pari passu</i> with other senior lenders. Sponsors provide full precompletion risk guarantee.
Investment Banks/US Capital Markets	10-12 years' maturity variable rates	Repayment schedule can match project cash flow. The documentation is relatively easy but a stable country environment and credible regulatory regime are important prerequisites. Market volatility is a factor and a project credit rating is a plus.
International Development Banks	Up to 5 years' grace 10-20 years' maturity approx. 7%	Key requirements are sovereign guarantees and international competitive bidding on equipment and construction.
International Commercial Banks	2-3 years' grace 5-8 years' maturity Prime (LIBOR) +	Generally require: political risk insurance; security interest in revenue stream (escrow accounts); and guaranteed revenue stream. May also need development bank cover.
Institutional Investor/Public bonds	15-20 years' maturity LIBOR+	Require well-developed local capital markets, project credit rating, underwriting capability, and local liquidity. Free currency exchange is a plus.

Source: Study team.



Source: Study team.

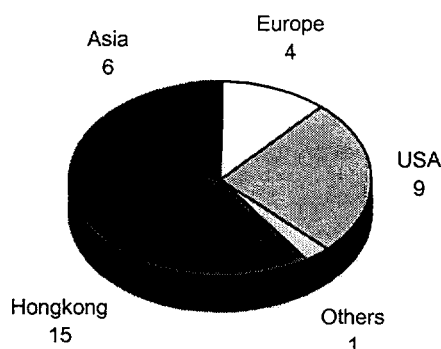
Only seven projects have tapped commercial bank loans without ECAs providing coverage. However, these are exceptional cases with special factors mitigating risk. For example, the Yangpu power project is a captive power plant and the strength of the project sponsor's balance sheet was likely an important factor. The sizable commercial bank loans mobilized under the Shajiao B and Shajiao C projects had credit enhancement through a government guarantee. The basis for the commercial loan to the Zhabei project was the financial strength of the Shanghai Municipal Power Company, one of the most creditworthy power utilities in China.

The policy risk coverage of the People's Insurance Company of China has been a decisive factor in securing commercial financing. Commercial banks often have very strict credit criteria. After loan agreement signing, these banks also have a number of

conditions prior to disbursement. For example, Annex 3 lists 63 prerequisites required for the withdrawal of loan proceeds, according to a project case study. Furthermore, a commercial loan often becomes available only when the construction of the project is 70 percent complete, making it necessary for project sponsors to secure some type of bridge financing.

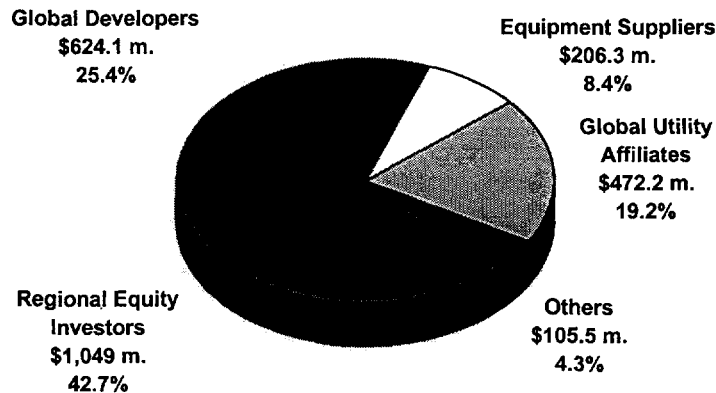
More than 40 percent of the private investors active in China's power development have been Hong Kong firms (see Figure 2.2). Projects that reached financial closure prior to 1994 had Hong Kong investors exclusively. However, the success of the pilot projects, the sustained growth of the sector, the stronger confidence in the "new plant/new price" policy and the enactment of the Electricity Law in 1995 gave investors more confidence in China's power sector and more companies/investors entered the power market. Since then, about 35 companies have concluded financing packages for power projects in China. However, this number is relatively small compared to the list of over 200 companies active in power project development worldwide.

**FIGURE 2.2: DISTRIBUTION OF PRIVATE INVESTORS BY REGION**



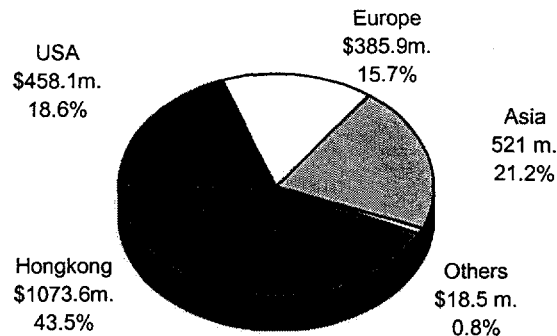
*Source:* Study team.

As Figure 2.3 indicates, Hong Kong investors have the highest level of equity shares followed by other Asian, US and European investors. The allocation of shares suggests that the lack of a comprehensive legal and regulatory framework has been a far greater deterrent to Western investors than to Asian investors. Furthermore, the participating Hong Kong investors have their primary business activity on mainland China, making it possible for them to finance part of their debt through their local currency earnings. However, this type of financing is not suitable for most international investors and has been addressed with "comfort letters" informally guaranteeing access to foreign exchange. They normally prefer project finance structures that limit their exposure to equity placed into the project company with other risks borne by purchasers and project contractors.

**FIGURE 2.3: EQUITY PARTICIPATION BY DIFFERENT PLAYERS**

Source: Study team.

Figure 2.4 shows the equity distribution of active investors by type of player. Regional equity investors, defined as those who have business activities only in Asia or, for some, exclusively in China, hold the largest equity share, 43 percent of the total equity amount. The group with the next largest equity holding are the global developers, which contribute about 25 percent of the equity investment. The shares of global utility affiliates follow closely with 19 percent and those of equipment suppliers are significantly lower at 8 percent.

**FIGURE 2.4: EQUITY PARTICIPATION BY REGIONS**

Source: Study team.

In addition to large projects, there are numerous small- and medium-scale projects, usually 100 MW or less, involving private developers. They are often quicker to negotiate because (a) they normally have a total investment cost below the US\$30 million threshold requiring central government approval, and (b) they are easier to finance on a balance sheet rather than a limited-recourse basis. Furthermore, most small- and medium-scale plants sell electricity only to the municipal, county or township grids in which they

are located. The lack of need for contractual agreements with the provincial power utilities also helps to accelerate their development in contrast with larger projects.

There are no comprehensive national or provincial statistics on small- and medium-scale projects. However, rough estimates indicate that about 150 such projects are operating or are under construction countrywide. The estimated capacity of these installations is 8 to 10 GW, or 3-4 percent of the country's total installed capacity. Information related to these projects is not publicly available and difficult to gather. Based on data gathered during preparation of this paper, Table 2.4 summarizes selected characteristics of a sample of projects with a combined installed capacity of 1.9 GW. Annex 4 provides a detailed list of the projects.

**TABLE 2.4: SELECTED CHARACTERISTICS OF SAMPLE SMALL- AND MEDIUM-SCALE POWER PROJECTS**

Number of Projects	29	
Average Capacity	64 MW	
Average Investment Cost per kW Installed	US\$650	
Distribution of Plants by Fuel Type (%)	Coal	45
	Oil	45
	Hydro	7
	Gas	3
	<i>Total</i>	<i>100</i>
Average Private Shareholding (%)	51	

*Source:* Study team.

Most of the small and medium projects are thermal: coal-fired, cogeneration, or diesel/oil-fired units. However, plant mix varies by region. Although hydropower plants overall have a very small share of capacity, regions with large hydropower potential, such as Fujian and Hunan, have a number of such projects. In Zhejiang, out of 32 projects, the majority (69%) are cogeneration plants (see Annex 4).

In contrast to large projects, foreign developers (mostly from Hong Kong and Singapore and some other Asian countries) have a controlling interest in most of the small and medium projects. If the average investment cost and shareholding data in Table 2.3 are indicative of the estimated 8-10 GW of small- and medium-scale projects with private participation, then the private capital mobilized by these ventures would be on the order of US\$2.6 to US\$3.3 billion.

Table 2.5 lists major power projects under active development for which the central government has approved FDI. Some of these are approaching financial closure and others are in the early stage of negotiation. The table also indicates that the well-known international developers and manufacturers are showing more interest in China's power market. The government is discouraging the development of oil/diesel-fired power plants and small- and medium-size coal-fired power plants due to their higher economic



cost and serious environmental problems. However, the government is encouraging some cogeneration power projects in cases where there is a demonstrated demand for heat load. Furthermore, the government would like to see a continued growth in private sector involvement in the power sector to help develop larger, more efficient generating units with state-of-the-art technology to replace existing small inefficient units.

**TABLE 2.5: MAIN POWER PROJECTS UNDER ACTIVE DEVELOPMENT**

Name	Capacity (MW)	Location	Type	Foreign Developer	Status of Approval	
					Project Proposal	Feasibility Study
Changsue	2 x 600	Jiangsu	WFO	IEG/ABB		Yes
Jiaxing	4 x 660	Zhejiang	JV	National Power	Yes	Yes
Dengfeng	2 x 350	Henan	JV	Coastal Power	Yes	
Huanggang	2 x 600	Hubei	JV	EDF	Yes	
Huangshi	2 x 300	Hubei	JV	CEA	Yes	Yes
Puqi	2 x 300	Hubei	WFO	Sithe Energies	Yes	Yes
Taishan	2 x 600	Guangdong	JV	Marubeni	Yes	
Changsha	2 x 350	Hunan	WFO	National Power	Yes	
Qiangwan	2 x 350	Guangdong	JV	China Power & Light	Yes	
Jiangzhou	2 x 200	Jilin	JV	N.A.	Yes	
Beima	2 x 300	Sichuan		N.A.	Yes	
Nanpu	2 x 300	Fujian	JV	N.A.	Yes	

Source: Study team.

**Divestiture of Assets by Stock Exchange Listing.** The central government started also to tap domestic and foreign private funds for power sector development through the listing of selected power companies on domestic and foreign stock exchanges. Table 2.6 lists the major public offerings between May 1994 and September 1997. On the domestic market, the first listing was Shenzhen Energy on the Shenzhen Stock Exchange in April 1993. On the foreign markets, the first public offerings took place in 1994. They consisted of shares in the Huaneng International Power Development Company (HIPDC) and the Shandong HIPDC offered on the New York Stock Exchange. The results were disappointing and delayed other offerings. However, the successful listing of the Datang Power Co. Ltd. on both the Hong Kong and London Stock Exchanges in 1997 has sparked a new round of listing attempts.

The recent failed listing of a US\$285 million equity offer of Shandong International reflects in large part the hesitancy of the market in supporting continued investment in emerging market equities. It is likely that an overreaction by markets to heightened risk in emerging markets, uncertainty of reform, and devaluation fears have led to depressed share prices. It does not, however, seem to reflect the long-term attractiveness of the Chinese power sector. The five major investment firms (Warburg Dillion Read, ING-Barings, ABN-AMRO, and Donaldson, Lufkin & Jenrette) have all made recommendations in 1999 supporting investment in the three publicly traded power companies.

TABLE 2.6: MAJOR POWER COMPANY STOCK EXCHANGE LISTINGS

Company	Installed Capacity (MW)	Capital Raised (million)	Shares Offered (%)	Stock Market	Date of Listing
Huaneng International	2,900	US\$600	27.71	New York	Oct-94
Shandong Huaneng	1,750	US\$330	30	New York	Aug-94
Beijing Datang	3,150	US\$450	27.71	Hong Kong, London	Mar-97
Zhejiang Southeast	1,330	US\$208	25	Shanghai, London	Sep-97
Shnergy	1,900	Y 240	10	Shanghai	Jun-95
Longdian A	N.A.	Y 240	12.83	Shanghai	Jul-97
Longdian B		US\$24	32.07	Shanghai	Jul-97
Huayin Electric	N.A.	Y 390	N.A.	Shanghai	Sep-96
Neimeng Huadian	N.A.	Y 200	N.A.	Shanghai	May-94
Gezhouba	275	Y 1,200	N.A.	Shanghai	May-97
Zhangze Electric	N.A.	Y 90	N.A.	Shenzhen	Jun-97

N.A. = Not available.

Source: Study team.

Stock price performance of power companies over the past several years has been erratic, in part reflecting the movement of emerging market indices: a dramatic fall in the summer of 1998, partial price recovery by end-1998/early 1999, and a second rapid price decline following fears of contracting power demand and possible devaluation of the Renminbi in 1999. Despite short-term declines in power demand and some lower utilization rates, the earnings of the three major utilities have remained relatively strong given a growth in capacity. Box 2.1 discusses the divergence between company performance and stock price for Beijing Datang and Huaneng. Growth forecasts indicate continued strong earnings due to capacity coming on line in the next several years. Given this fact, prospects for relatively good financial performance appear strong.

By the end of 1998, altogether there were 25 Chinese power generation companies listed on domestic and/or foreign stock exchange markets (Annex 5). Of this total, 21 listings were on domestic stock exchange markets. Among these 21 companies, all except one company offered A shares only.<sup>1</sup> However, the Longdian Power Generation Company offered both A and B shares on the Shanghai Stock Exchange. Public offerings of these companies raised a total of about Y 8 billion (US\$964 million equivalent) through A shares and US\$24 million through B shares. One company—the Zhejiang Southeast Power Generation Company<sup>2</sup>—has a listing on both the Shanghai and

<sup>1</sup> A shares are denominated in local currency and traded on the domestic stock market among residents of the People's Republic of China. B shares are denominated in foreign currency (mainly US dollars) and traded on the domestic stock markets among nonresidents of the People's Republic of China.

<sup>2</sup> A large company with an installed capacity of 1,332 MW.

**BOX 2.1: TWO CHINESE POWER COMPANIES: DIVERGENCE OF COMPANY  
PERFORMANCE AND STOCK PRICE**

**Beijing Datang**

Beijing Datang's output increased in the latter part of 1998 and growth is expected to continue throughout 1999. Its principal market is the North China power grid where demand and utilization rates have remained strong at about 5,500 hours. Expanding output is driving earnings growth, with capacity to expand by 9.6 percent in 1999 and by 7.5 percent in 2000. Expected earnings will increase by about 20 percent in 1999 and 35 percent in 2000. Datang has several competitive advantages. It is a low-cost producer with 70 percent of its on-grid tariff price the lowest sold into the Beijing-Tianjin-Tanghan power grid. Another major advantage for the company is its strong balance sheet with low debt and a net cash position of Y 700 million. Most estimates price Datang at a discount to the market price of about 25 percent, at a price of about HK\$1.75.

**Huaneng Power**

Huaneng's installed capacity will increase by a rapid 53 percent from 1997 to 2000, a rate that may make many investors nervous, given cursory news reports of weakened power demand. Total power output increased by 9 percent for 1998. Earnings are expected to remain strong, given increased capacity expansion due for 1999. Huaneng has several major advantages. Most importantly, it is the only IPP with a well-diversified portfolio: eight plants operating in six different power grids. Whereas in certain provinces such as Shandong fear is that capacity growth will outpace demand, Huaneng's portfolio minimizes risks. Moreover three of its provinces, Shanghai, Hebei, and Jiangsu, have maintained demand growth. The principal disadvantage of Huaneng, which may have contributed to investor fears, is its high US dollar exposure of about US\$1 billion and a debt-to-equity ratio of about 63 percent, though the latter is expected to decline to near 50 percent by 2000. By most estimates, its stock is trading at about HK\$1.75, which is at a discount of about 40 percent.

*Source:* Study team.

London Stock Exchanges. Three power companies with a combined total capacity of 7,800 MW are listed on the New York, Hong Kong and London Stock Exchanges. Combined public/ private offerings have raised a total of US\$1,380 million. Most of the companies listed—and all of those listed on foreign stock exchange markets—had received development rights for expansion projects subject to approval by Chinese authorities.

The government is currently planning to list a number of companies on the domestic stock exchange and overseas stock exchanges. The domestic capital market, due to its small size and volatile nature, is not expected to play a major role in providing the large amounts of funds required by power development in the near future. At the same time, prospects for attracting a larger number of institutional investors, generally more risk-averse than developers, seem unlikely in the near future without full corporatization of the sector's enterprises, the creation of a regulatory body and the development of regulation techniques and procedures. However, the government still intends to maximize its opportunities on the Hong Kong Stock Exchange and other stock exchanges.

## CHAPTER 3. THE EVOLVING POWER SECTOR FRAMEWORK

### HIGHLIGHTS

- ❖ Since the early 1980s, China has been in the process of restructuring its power sector for greater market orientation and private sector participation.
- ❖ This restructuring includes the development of specific rules and regulations to promote private participation and decentralization of authority to enable provincial governments to take responsibility for financing their own investments instead of depending on centralized funding.
- ❖ The FDI Laws and Regulations and the Electricity Law of 1995 are the key laws governing private sector participation in electricity development. GOC is in the process of establishing special regulations for infrastructure BOT projects.
- ❖ GOC recently has taken important steps to introduce competition in generation and to clarify the regulatory framework.
- ❖ Despite far-reaching reforms in the power sector, GOC still exercises control through a multilevel government approval process for all projects.

### Rationale for Reform

GOC has been gradually reforming the power sector since the early 1980s in an effort to improve its operations in line with economic reforms. In the past, the power sector had operated like a large government department with centralized authority and project funding through budget allocations, and coordination of activities in accordance with centrally issued directives. Responding to a capital crisis of the early 1980s, GOC, in 1985, introduced the Provisional Regulations on Encouraging Fundraising for Power Construction and Introducing a Multi-Rate Power Tariff. These regulations removed GOC's monopoly as the sole supplier of investment funds and began the process of ownership diversification. GOC also increased the management autonomy of provincial power companies, and encouraged provincial and local governments to mobilize investments on their own. As Chapter 2 indicated, provincial and local governments took initiatives to establish partnerships with the private sector to acquire the necessary capital for power generation facility expansion. However, as China gained experience in the

process it became evident that reform of the sector framework was necessary to attract a significant level of private investors and introduce competition into the power system.

### **Key Steps to Restructuring**

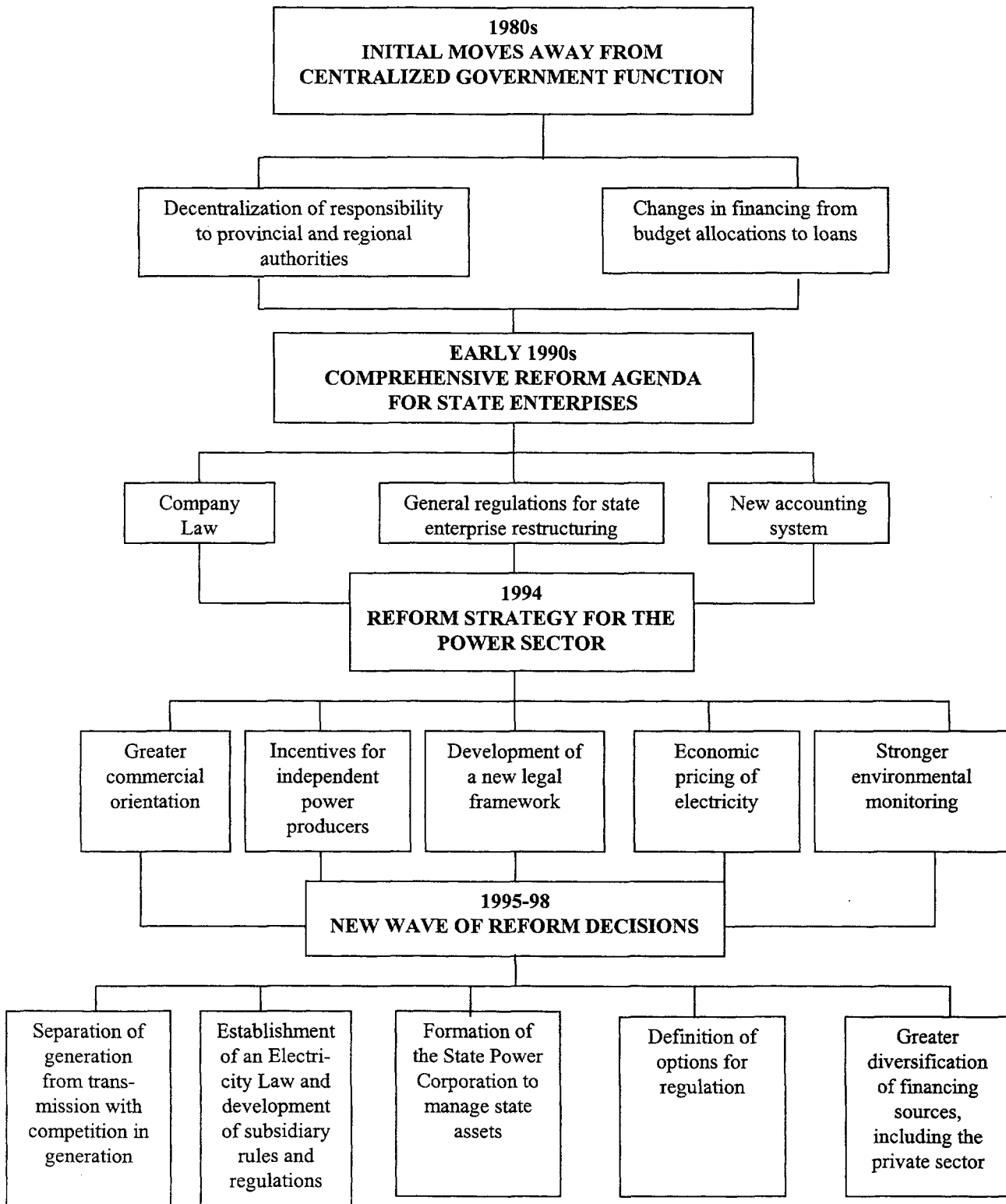
Figure 3.1 outlines the key steps in China's power sector reform process in response to declining central government funding and the increased responsibility of local governments to find sources of financing for their investment needs. First, in the 1980s, GOC began the process with the decentralization of administrative authority and a change in funding from government allocations to loans. Second, in the early 1990s, GOC established a basic reform strategy for all state-owned enterprises (SOEs) including a company law, regulations governing restructuring, and a commercial accounting system. Third, in 1994, GOC established a reform agenda for SOEs, covering sector policies, commercialization incentives, the legal and regulatory framework, pricing policies, and environmental monitoring guidelines. Fourth, since the establishment of the Electricity Law in 1995, GOC has embarked on a new wave of reform decisions to create the necessary structure to apply the law and key principles of market orientation such as efficiency and competition. These decisions include the separation of generation from transmission operations, the establishment of competition in generation, the formation of the State Power Corporation (SP) to manage GOC's assets in the power sector, the definition of options for regulation; and greater diversification of funding sources.

### **Laws and Regulations**

Prior to the enactment of the Company Law in 1993 and the Electricity Law in 1995, there was no legal basis for private sector participation in power sector development. The central government tightly controlled all aspects of the sector, subject to more than 500 laws, regulations, and administrative directives.

The serious power shortages of 1988-91, President Deng Xiaoping's South China speech on reform, and the economic boom of 1992-94 sparked local governments' interest in tapping private funds to develop their power sectors. However, the negotiations of the potential deals quickly stalled because the FDI laws and regulations, mainly tailored for export-oriented industries, were not adapted to the unique power sector requirements. The main problem was the need for long-term market and tariff commitments because of the sector's capital-intensive nature, long economic life of the investments, and lack of an acceptable allocation of project risk that met international project finance standards. Investors' worries related mainly to the access to foreign exchange to repatriate profits in local currency and administrative limitations on projected returns. Local government agencies, provincial power companies and foreign developers looked to central government agencies for answers. The central government agencies (notably the ex-State Planning Commission—SPC—and the ex-Ministry of Electric Power—MOEP) agreed on the need for a transparent, comprehensive legal and regulatory framework but indicated that its development would be staged and take time.

**FIGURE 3.1: KEY STEPS IN POWER SECTOR REFORM**



Source: Study team.

Except for the “new plan, new price” policy, which the government issued in 1985, most of the laws and regulations for FDI investments were promulgated after 1994 (Table 3.1). The major one is the Electricity Law which explicitly legalized, for the first time, foreign and private investments in the power sector. Most of the others are supporting rules which address specific issues that foreign investors have raised, such as the clear definition of the industry segments allowing foreign/private investor participation; the principles of regulation for foreign-funded power plants, and foreign exchange convertibility.

**TABLE 3.1: KEY REGULATIONS AND DIRECTIVES FOR FDI IN THE POWER SECTOR**

Date	Law, Regulation or Directive	Main Contents and Significance
March 1994	MOEP, “Temporary Provision on the Utilization of Foreign Capitals for Electric Power Construction.”	The first provision issued by a central government agency to define the segments in which FDI is permitted; specifies the permissible ownership structures and financial arrangements; and describes the procedures and principles to be followed in mobilizing FDI for power projects.
June 1995	State Council, “Temporary Provision Guiding the Direction of Investment by Foreign Investors,” “Sector Guiding Catalog for Foreign Fund on Project Finance Basis.”	The first regulation approved by the State Council that opens the power industry to FDI. It stipulates that FDI is encouraged in the construction and operation of all types of power generation facilities, and it is prohibited in the power transmission and distribution sectors.
August 1995	SPC, MOEP, MOC, “Notice on Issues Related to the Approval of Concession Project Implemented on an Experimental Basis.”	Formally recognizes BOT as a way of attracting FDI to develop infrastructure projects; defines the infrastructure sectors open to foreign investors to develop BOT projects and specifies the approval and solicitation procedures; lays out the principle on the issue of foreign exchange availability and convertibility.
December 1995	National People’s Congress, “Electric Power Law of the People’s Republic of China.”	Explicitly stipulates that the generation sector is open to investment by all economic entities and individuals, both domestic and foreign.
January 1996	SAFE, “Reply on Issues Related to the Availability of Foreign Exchange under Laibin B BOT Project in Guangxi.”	Clarifies that the availability and convertibility of foreign exchange required by infrastructure projects with revenue in local currency are generally assured as long as the projects have obtained the necessary approval from the central government.
May 1996	MOEP, “Provision on the Approval Procedure of Utilizing Existing Assets to Mobilize Foreign Investment.”	Defines the procedures and documentation requirements for privatizing existing assets owned by the central government, including transferring the ownership and management rights to private investors and offering public equity in the stock market.
September 1996	MOEP, “Temporary Provision on Standardizing the Administration of Power Purchase Agreements.”	Defines the general clauses to be included in a PPA; specifies the principles for tariff structure and level determination; and stipulates the government approval procedure.
April 1997	SPC and SAFE, “Temporary Provision on the Regulation of Mobilizing Foreign Fund on Project Finance Basis.”	Clarifies the definition of project financing and specifies the type of projects it generally applies to; specifies the approval procedures and documentation requirements; and stipulates that no domestic institution or agency is allowed to provide financial guarantees in any form.

MOC = Ministry of Communications; SAFE = State Agency for Foreign Exchange.

Source: Study team.

The FDI laws stipulate the parts of the power system eligible for private ownership, acceptable forms of private participation ownership, and specifications for the financial structure for different type of private participation. They limit private investment to generation facilities. They permit private ownership without shareholding limitation for all generation plants/companies, except for hydropower plants with installed capacities of more than 250 MW. The laws expressly prohibit private investment in transmission and distribution facilities.<sup>1</sup> The allowable forms of private participation are: (a) partial or total divestiture (ownership diversification) of existing assets; and (b) direct investment in new projects.<sup>2</sup> Concerning the financial structure, the laws require 25-30 percent equity for new projects and 35-35 percent for existing assets.

### **Proposed Build-Operate-Transfer (BOT) Regulations**

Recognizing the deficiencies of the current legal framework for private power development, the ex-SPC has prepared and submitted to the State Council, comprehensive BOT regulations. These regulations have resulted from three years of discussion with bilateral institutions and private developers, taking account of the experience gained during the development of the Laibin B project, the first competitively bid BOT project in Guangxi province. If enacted, these regulations would represent the first major step to comprehensively address foreign investment issues in infrastructure development. The draft regulations, outlined in Box 3.1, are still under review. These regulations: (a) define a BOT project as a wholly foreign-owned private project, thereby excluding JVs and/or domestic private sector involvement; (b) specify the procedures and institutional procedures for proposal and approval; and (c) clarify government policy on the repatriation of profits (availability of foreign exchange in the absence of convertibility).

### **Changes in the Power Sector Structure**

In 1988 GOC made some efforts, at the regional and provincial levels, to create power companies separate from government power bureaus. In theory, the power companies were supposed to assume responsibility for power system management according to commercial business principles, while the power bureaus were to exercise solely a regulatory role. This reform, however, did not take place in practice. Despite the separate names, there was no meaningful separation between the government and the utility, a situation known in China as “one organization with two name plates.” Contrary

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<sup>1</sup> These facilities are prohibited from private sector ownership due to the lack of clarity of ownership structure and pricing and management issues that still need to be resolved.

<sup>2</sup> The divestiture of assets is governed by the “Provision on the Approval Procedure of Utilizing Existing Assets to Mobilize Foreign Investment.” The investments in new projects are governed by general FDI rules applying to joint ventures.



### BOX 3.1: HIGHLIGHTS OF THE PROPOSED BOT REGULATIONS

The former SPC proposed new BOT regulations to further promote FDI in China's infrastructure sectors. A number of concerned government agencies have commented on the regulations, which are now under review by the State Council. The highlights of the proposed BOT regulations (in their draft form) are summarized below.

- Foreign investors are encouraged to develop projects in China's infrastructure sectors according to the BOT model. During the concession period, the project developer is fully responsible for the design, procurement, financing, construction and operation of the facility and is entitled to all revenues generated by the facility.
- The infrastructure sectors open to foreign investors to develop BOT projects include thermal power generation, small- and medium-size hydropower plants, highways, water supply plants, tunnels and bridges, etc.
- The local government would submit a project proposal to SDPC through the line ministries if it intended to grant a concession for a particular project to foreign developers. SDPC, and the State Council in many cases, would review the appropriateness of the proposal and approve or disapprove it.
- Once the project proposal is approved by SDPC or the State Council, the foreign developers would be selected through an open competitive bidding process. The local government would sign a concession agreement with the developers after approval of the contract award package by SDPC or the State Council.
- A BOT project is defined as one to be 100 percent owned by foreign investors and no domestic equity participation. The debt portion of the project cost would be in foreign exchange. No government or government financial institutions would be allowed to provide any form of guarantee to the sponsors or lenders.
- During the concession period, the government would ensure the availability and convertibility of the foreign exchange required by the project for debt service, equity return and operating expenses. In case the government's policy would adversely affect the project's cash flow, the necessary measures to compensate the sponsors/investors would be taken.

*Source:* Study team.

to the original intention, in some aspects overall government involvement in utility operations actually increased—the addition of provincial and local bureaucracy to central government involvement. However, in recent years, power enterprises have begun to achieve greater commercial autonomy and operate as commercial organizations responsible for their profits and losses.

Until the mid-1990s there were concerns about China's gradual pace of power sector reform. However, taking into account the size and complexity of the country and its long history of a centrally planned economy, the progress achieved in the 1990s is widely recognized as among the most successful reform experiences. Now that China has

established a comprehensive reform agenda and a legal framework, the country is taking steps to define corporate governance and management of state assets; introduce competition in generation; determine the organization, functional responsibilities and procedures for the regulatory authority; and assess the various options for large-scale capital mobilization to implement the planned large-scale expansion of power facilities outlined in Chapter 1.

GOC is currently implementing the separation of generation from transmission facilities and introducing competition in generation in six provinces/municipalities: Zhejiang, Shanghai, Shandong, Heilongjiang, Liaoning, and Jilin. Also, in 1998, the National People's Congress abolished MOEP and transferred its state ownership and commercial functions to SP and its government and regulatory function to the State Economic and Trade Commission (SETC). These actions have resulted in a clearer separation of government from enterprise functions.

### **The Approval Process**

Despite the far-reaching reforms of the 1990s, GOC still exerts tight control over the power sector. For example, multiple administrative agencies continue to govern the sector's development and operation according to yearly and five-year plans. Various government agencies scrutinize power projects before their approval. Prior to the July 1998 reorganization of the government, power projects—especially those involving private and/or foreign investors—required approvals from at least 10 administrative agencies.

Table 3.2 outlines the current government review and approval procedures for power projects with FDI. The procedures clearly indicate: (a) the prominent role of SPC, renamed State Development and Planning Commission (SDPC) following the 1998 restructuring of the government; (b) the complex involvement of numerous government agencies at the provincial, regional and central levels; and (c) the unclear delineation of responsibilities among the intervening agencies.

The approval process of a Sino-foreign JV or a wholly foreign-owned project/company is the same as that for Chinese projects. The one exception is for the repatriation of profits, which requires availability of foreign exchange. The process usually begins at the provincial level and consists of four major consecutive steps: (a) approval of the project proposal, (b) approval of the feasibility study, (c) incorporation of the project company, and finally, (d) authorization to begin construction. The first two stages are the most critical and time-consuming, involving many government agencies (Table 3.2). While required, the two last stages are merely formalities.

**TABLE 3.2: KEY INSTITUTIONS RELATED TO FDI IN POWER PROJECT**

<b>Institution</b>	<b>Responsibility</b>
State Council	Approval of project proposal and feasibility study report.
SDPC	1. Review the project proposal to ensure: (a) compliance with the yearly and five-year plans for energy development; (b) adequacy of proposed financing plan; (c) adequacy of design proposed in the technical soundness of the project; and (d) soundness of proposed construction, procurement and operation arrangements. 2. Review and approve the annual tariff adjustment.
SETC	Review and approve the project proposal and feasibility study reports of projects categorized as rehabilitation and technical renovation projects (unclear delineation of responsibility sanctions create overlap with SDPC).
MOFTEC	Review and approve JV contracts, appendices and Articles of Association (Stage 3).
SAFE	Review and approve foreign currency financing or guarantee agreements; register the estimated annual foreign exchange requirements and issue certificates for obtaining foreign exchange (Stage 2).
MOEP	1. Review the project proposal to ensure: (a) compliance with the yearly and five-year plans for power development; and (b) availability of the basic infrastructure required by the project. 2. Review the feasibility report and supplementary documents to determine if the project is technically, financially and economically viable (Stages 1 and 2).
SEPA	Review the environmental impact assessment report and issue the final environmental compliance certification.
Regional Power Group	1. Review the project proposal to determine if it fits the power development plan in the region. 2. Review the project feasibility report to see if it is prepared according to MOEP's policies and rules (Stages 1 and 2).
Provincial Price Bureau	Review and preapprove the estimated tariff level and pricing principles as well as the annual tariff adjustments (Stages 1 and 2).
Provincial Economic and Planning Commission	Review and preapprove the project proposal to determine if it fits the energy development plan in the province (Stages 1 and 2).

MOFTEC = Ministry of Foreign Trade and Economic Cooperation.

Source: Study team.

The purpose of the first stage of the approval process is to ensure the project is in line with the planned development of the sector and is based on sound technical and financially acceptable principles. It begins with preliminary project discussions among provincial agencies to reach consensus on the basic concept of the project. This stage also must identify the foreign partner in the case of a JV. If the project receives approval at the provincial level, the provincial power company (the Chinese developer) has the responsibility of preparing a project proposal (as partner and/or single buyer of the output) for submission to ex-MOEP<sup>3</sup> directly or through the Power Group Administration.

<sup>3</sup> If this responsibility is transferred to SP, this might create a "conflict-of-interest" situation.

The project proposal must include the basic concept of the project and a letter of intent from all parties involved in the project. If the project proposal is acceptable to the agency replacing MOEP, it is subject to further review by SDPC. If SDPC finds it acceptable, it submits the project proposal to the State Council for approval. The approval of the project proposal clears a major hurdle in the project development process but does not ensure its successful outcome. However, it usually gives enough comfort to all parties involved to proceed with full project preparation.

The second and most critical stage in the process is the approval of the feasibility study. Its approval sequence is identical to the one followed for the project approval. It involves the same institutions plus the State Environmental Protection Agency (SEPA) and its representations at the provincial level. The State Assets Administration Bureau (SAAB) also participates in the process if the project involves transfer of state-owned assets.

The feasibility study must include: (a) a detailed technical description of the project; (b) a complete list and origin (domestic or foreign) of the equipment to be procured; (c) the detailed project cost estimate; (d) the financing of the project (equity and debt) and the terms and conditions of the debt; and (e) detailed financial analyses stressing the estimated price and annual foreign exchange requirements. It should also include, as attachments, the draft shareholder's agreement to be signed by the partners, or at least the guiding principles of the contract, funding commitment letters from the local banks providing local financing, an environmental assessment report approved by SEPA, and a letter from SAAB approving the valuation and transfer, if necessary, of state assets.

Following approval of the feasibility study is the submission to the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) of the JV contract or the application for establishing a wholly foreign-owned company. The Articles of Association of the company to be created should be attached to the contract or application. MOFTEC's approval allows the company to apply for a business license delivered by the State Administration of Industry and Commerce (SAIC). The issuance of the license concludes the approval process of the project.

The authorization to begin construction is mainly seen as an opportunity to review the preparatory work and ensure that the project is implemented according to the approved feasibility study.

## CHAPTER 4. EVALUATION OF PRIVATE INVESTOR CONCERNS

### HIGHLIGHTS

- ❖ Despite some valid concerns about the Asian crisis, there are significant indicators that the crisis may be less severe in China than in other countries and that there is still considerable scope for private sector participation.
- ❖ There are reasonably strong assurances of foreign exchange convertibility if projects are developed according to the rules which, though slow and cumbersome, are fairly transparent.
- ❖ Generally GOC has abandoned rate-of-return (ROR) regulation in favor of a “cost plus approach,” based on coverage of annual debt repayments. Even though developers are not satisfied with the annual tariff adjustment process, it addresses some of their concerns about devaluation and the need for indexation. However, GOC still requires the ROR to fall within some acceptable limits.
- ❖ The length of the project approval process is still an impediment to investments. However, it is important to follow the government approval process. Some investors have tried to circumvent it and in so doing faced or are at risk to face problems enforcing certain types of agreements such as the convertibility of earnings into foreign currency.
- ❖ Guarantees available from GOC have diminished. In practice, Export Credit Agencies (ECAs) or commercial banks provide the main coverage of political risk. There is also a need for more transparency of the accounting system to allow better assessment of the financial risk of offtakers.

### Impact of the Asian Economic Crisis

Outstanding concerns about the future of private involvement in China's power sector have been exacerbated by the Asian economic crisis. In Asia, and other emerging markets, the initial response to the recent financial crisis by some power developers, and most international lenders, was to avoid further investment to minimize exposure. Investment activity fell. Securing financing became more difficult due to reduced need for power, lack of liquidity in local markets, increased default risk, failure of certain

utilities to honor contractual arrangements and currency devaluation throughout the region. These factors resulted in decreased availability of financing throughout Asia, including China. While not directly impacted by the crisis, China was still perceived by financing institutions as facing similar problems as its neighbors. Slow growth and devaluation of the Renminbi were among the major concerns.

Few countries in Asia now offer an attractive investment environment. Due to the economic crisis, power demand in some countries has contracted, resulting in a number of utilities with overcapacity, costly power purchasing agreements (PPAs), low tariff regimes, and increased credit risk in emerging markets. Yet, despite these factors and a retraction of investment—notably in the Philippines, Indonesia and Thailand—private power developers continue to look for attractive foreign investment opportunities

China provides an attractive alternative option for foreign investors because the impact of the economic crisis on its power sector has been less severe than in other countries. First, even after the crisis, long-term power demand is relatively high in some provinces (3 to 5 percent) and energy elasticity to GDP is well below comparable figures in other countries (0.6 versus 1.2 in the Philippines). Second, China has limited its risk exposure by leveraging foreign exchange loans to finance plant construction. Most projects had been financed at 50 to 60 percent in local currency, providing a natural hedge against currency risks that negatively impacted other projects in the region. Construction costs were also low because of use of local equipment and efficiency improvements brought about by involvement of foreign partners. Third, installed private power generation is a relatively small percent of peak demand, about 6 percent as compared to 10 to 58 percent in other Asian countries. Given the goal to increase private investment and decrease government funding for power investment, private power investment opportunities are likely to increase.

In the past year there has been a slight downward trend in power demand growth. In mid-1998, economic growth figures fell slightly below the government objective of 8 percent. It is reported to be 7.8 percent for 1998. Countrywide demand for power remained weak in 1998, with 2.6 percent annual growth compared to over 5 percent in prior years, although there has been strong recovery in 1999. Some provinces, particularly inland, are experiencing negative growth. However, in most coastal provinces, such as Jiangsu, Shanghai and Zhejiang, the demand for power has met 1998 projections and is expected to continue. Most of these coastal provinces are expected to continue with power growth rates above 5 percent in the near term. Even in a worst-case scenario, China is planning for 12-15 GW of additional capacity over the next decade and this will provide significant opportunities for private investors. The recent downturn in demand will likely delay provincial and state approvals for a number of projects. However, there are indications that this slowdown is primarily a short-term phenomenon.

### **Potential Foreign Exchange Risks**

Private investors are generally concerned about two types of foreign exchange risks: possible devaluation and limitations on availability. Considering the recent dramatic currency devaluations in Asia, there is a mounting fear that China may soon face a similar problem. Mitigating this fear is a priority for developers and lenders. The availability of foreign exchange is also a concern in the case of diminished reserves due to economic stagnation.

Project developers and financiers are increasingly concerned that devaluation of the Renminbi could negatively affect project cash flow, requiring an adjustment of the Renminbi-based electricity tariffs. For power developers, this is of particular concern as they typically borrow in US dollar-denominated funds and receive revenue in the Renminbi. They in turn convert Renminbi to US dollars for debt service and profits. Based on recent experience in the region, investors are worried that social pressures may make it difficult for the central and provincial governments to comply with the tariff adjustment mechanisms in PPAs, in the case of a serious currency devaluation. However, Chinese authorities stress that: (a) the fundamentals of the economy are still sound and that the Renminbi value is far more than 80 percent based on the market; and (b) experience in other sectors shows that all problems that faced JVs and investors have always been discussed and solved to both parties' satisfaction.

Foreign exchange will, except in the case of force majeure, be available to meet debt service obligations and repatriate profits for all projects duly approved by the government. Project finance regulations followed by SDPC require that the State Agency for Foreign Exchange (SAFE) make provisions for the required foreign exchange requirements of the project in the state plan on international borrowings. They also require that the terms, tenor and pricing of the financing are acceptable to GOC.

While China has stringent cumbersome procedures for foreign currency approval, there is fortunately a high degree of transparency in the process. As long as the project sponsors follow the prescribed procedures GOC is likely to honor contracts. However, any circumvention of the process could result in problems that could endanger long-term project viability.

### **Rate of Return and Tariff Issues**

Following statements made by high-level decisionmakers about strictly limiting rates of return (RORs) and concerns expressed by foreign investors, the Chinese government has shown increased flexibility on ROR issues and the profitability of power projects. SP and SDPC seem to have abandoned limits on RORs with more focus on a "cost-plus pricing" approach. However GOC still stresses that the ROR must fall within

established “reasonable limits.” According to rules established by SDPC,<sup>1</sup> GOC will use ROR as a financial indicator for project evaluation. The basis of the ROR is the long-term interest rate of the international capital market with consideration for power industry operating conditions, including risk and profit. However, the assessments to determine these indicators do not reflect the actual value of electricity to customers and therefore distort the market. Moreover, developers stress that the actual return may differ from the projected return estimated during project approval. It is difficult to predict market changes and assumptions made during the assessment of the ROR, which will always differ from future actual conditions.

Tariff policy is based on the Electric Power Law of 1995 and the “new plant, new price” regulations. In particular, it stipulates that tariffs should permit cost recovery with allowances for taxes and reasonable profits. The formal tariff approval process consists of a two-tier system: the establishment of initial tariff levels and annual tariff adjustments.<sup>2</sup> The tariffs are based on annual financial statements with a focus on debt repayments. Given the short maturity of the loan compared to the economic life of the project, they are generally higher than economic costs. GOC adopted the annual revision rather than indexation (preferred by developers) to ensure that increases are “socially” acceptable. In the case of too-high tariffs, companies are offered financial incentives to keep the tariff increases at acceptable levels. The system generally worked up to now but there are signs of emerging problems.

It is today recognized that the “new plant, new price” regulations played a major role in alleviating power shortages and attracting foreign investors to China’s power sector. However, they have reached their limits and need to be adjusted to the new situation of the sector. A comprehensive assessment of existing regulations and the development of a comprehensive power pricing policy are needed urgently but their discussion is beyond the scope of this paper. The only recommendation here is that the new policy and regulations should be based on economic principles (“focus on price not cost”), conducive to efficiency and fair to customers and power developers.

### **The Project Approval Process**

The current slowdown in power demand in selected provinces and the proliferation of marginal projects without central approval highlight the need to abide by the formal—albeit slow—state-sanctioned approval process.

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<sup>1</sup> *Guidance Opinions on Strengthening the Economic Appraisal Work of Foreign Investment Power Projects*, SP, 1996.

<sup>2</sup> For a discussion of tariff issues see Chapter 5 of *China: Power Sector Regulation in a Socialist Market Economy*, Discussion Paper No. 361, 1997.



Initially, letters of support at the provincial level were necessary before SDPC would grant final project approval. However, this approach does not characterize many of the small power projects (less than 100 MW) currently in operation. In recent years, developers have chosen to pursue projects directly with municipal or provincial authorities, many of whom have been desperately in need of power. Many local authorities have bypassed the formal approval process, by not applying for central government approvals. Because the central government allows provincial approvals only for investments below a US\$30 million capital threshold, large projects were often intentionally split into smaller ones to avoid central government approval.

As a result of the current weakness in energy demand in some provinces, there have been selective cutbacks in power purchases and a delays in tariff approvals for some IPP projects. Unfortunately many projects that have bypassed central government approvals now face increased risks that the central government may not honor their contracts. It is possible to avoid this situation in the future by the issuance of detailed regulations, a clear delineation of the roles of the different agencies, and the provision of informative documentation to developers and financial market observers.

### **Guarantees**

China has offered several types of guarantees to private investors: state guarantees, provincial power company and government guarantees, and letters of support from the government. These guarantees have been rather informal but provided some form of political risk insurance and gave comfort to investors. The Chinese government clearly stated that no sovereign guarantees will be provided to commercial ventures/projects. And following the East Asian crisis and the Guangdong ITIC failure, the value of “informal” guarantees is being questioned. In recent project financing deals, ECAs or commercial banks have covered the political risk. Given the current political and economic climate, this practice is likely to continue.

Past guarantees from provincial power companies and governments, often through the provincial investment companies—ITICs—were common, usually as an added security for a project along with PPAs. Although they were not legally binding and thus unenforceable, they nevertheless did provide some comfort to lenders. It now appears that provincial guarantees are not as secure as once thought.

The failure of GITIC in Guangdong demonstrates the extent of the problem and raises question of whether the provincial investment companies will be able to honor their loan obligations. The central government has closed down GITIC and appears to be ready to address the problems in the other ITICs. Although the central government has stated it will honor their respective ITIC obligations, it will only do so if the project had received proper central government approvals. In the future, guarantees from provincial entities are unlikely to provide a reasonable level of comfort for lenders unless a project has obtained

all required approvals from central government entities. It also appears that some ITICS may be approaching financial collapse.

Letters of support may serve as a sufficient substitute for a formal guarantee. Typically SDPC would draft a letter stating that they would take all necessary measures to ensure that the power offtakers and the provincial government fulfill their responsibilities. A similar letter also could be provided by the provincial government and SP. However, in all of these cases the letters are not legally binding. The confusion over the strength and enforceability of guarantees highlights the need for: (a) both developers and lenders to focus on projects which have good economics, including a low-cost generation source with backing from strong, creditworthy power offtakers.

### **Conclusion**

These concerns have been discussed at length during the private power conference held in Beijing June 22-23, 1999. The discussions at the conference highlighted that private capital can still make an important contribution to financing power sector infrastructure in China. It stressed that China's power would remain attractive to developers and financiers as long as there is: (a) the implementation of further power sector reforms in a transparent process, where the scope, direction and schedule of reform can be assessed by potential investors in the Chinese power sector; (b) clarification and streamlining of the process for obtaining power project and tariff approvals; (c) development of mechanisms for and increased access to Renminbi financing for all power projects; (d) the separation of generation from the transmission networks; (e) commercialization of the various power companies that will be offtakers from private power projects; and (f) provision to power developers of direct access to customers so that they are able to bear more market risk in the future.

## ANNEX 1: PROJECTS INVOLVING DIRECT FOREIGN INVESTMENT

Plant	Fuel Type	MW	Construction Begin	Status	Foreign Capital (US\$M)	Private Equity (%)	Sponsors Based in	Location
1. Dayawan	Nuclear	1,800	1986	Operation	3,600	25	Hong Kong	Guangdong
2. Shajiao B	Coal	700	1984	Operation	373	100	Hong Kong	Guangdong
3. Zhujiang I	Coal	600	1990	Operation	96	50	Hong Kong	Guangdong
4. Shajiao C	Coal	1,980	1992	Operation	1,300	40	Hong Kong	Guangdong
5. Zhujiang II	Coal	600	1995	Construction	276	35	Hong Kong	Guangdong
6. Zhuhai	Coal	1,320	1996	Construction	970	45	Hong Kong	Guangdong
7. Yangpu	Oil	320	1992	Operation	240	100	Japan	Hainan
8. Qinglan	Oil	150	1994	Operation	130	100	USA	Hainan
9. Machan	Coal	250	1988	Operation	42	50	Hong Kong	Hainan
10. Zhangping	Coal	200	1992	Operation	14	25	Hong Kong	Fujian
11. Songyu	Coal	600	1993	Operation	84	25	Hong Kong	Fujian
12. Meizhouwan	Coal	700	1997	Construction	655	100	Indonesia/USA	Fujian
13. Zhabei	Oil	400	1995	Operation	146	30	USA	Shanghai
14. Pengcheng	Coal	600	1993	Operation	125	35	Hong Kong	Jiangsu
15. Ligang	Coal	700	1995	Construction	206	56.3	Hong Kong	Jiangsu
16. Huhu	Coal	250	1995	Operation	73	25	USA	Anhui
17. Hefei	Coal	700	1997	Construction	305	49	Singapore	Anhui
18. Jiaozuo	Coal	250	1996	Construction	148	70	USA	Henan
19. Rizhao	Coal	700	1996	Construction	387	25	Germany/Israel	Shandong
20. Hanfeng	Coal	1,320	1997	Construction	503	40	Germany	Hebei
21. Tangshan	Coal	100	1996	Construction	174	100	USA	Hebei
22. Zhengzhou	Coal	600	1990	Operation	70	25	Hong Kong	Henan
23. Xinxiang	Coal	400	1995*	Operation	173	90	Hong Kong	Henan
24. Jingyuan	Coal	600	1993	Operation	105	30	USA	Gansu
25. Shenhai	Coal	400	1993*	Operation	93	55	Hong Kong	Liaoning
26. Yangcheng	Coal	2,100	1996	Construction	897	25	USA	Shanxi
27. Laibin	Coal	700	1997	Construction	610	100	France	Guangxi
28. Weihe	Coal	1,200	1997*	Operation	332	51	Hong Kong	Shaanxi
29. Huibei	Coal	600	1997	Construction	86	25	Hong Kong	Anhui
30. Hefei lake	Oil	116	1996	Construction	45	70	USA	Anhui
31. Chengdu (II)	Coal	284	1996	Construction	154	51	Hong Kong	Sichuan
32. Wenzhou	Coal	600	1998	Construction	166	40	USA	Zhejiang
33. Shandong Power	Coal	3,000	1998	Construction	916	49	France/Hong Kong	Shandong
34. Houshi	Coal	1,200	1996	Construction	1,278	100	Taiwan	Fujian
Total		26,040			14,772			

\* These projects are already in operation. These dates indicate the year when the transfer of assets were completed.

Source: Study team.

## ANNEX 2: MAJOR PRIVATE PROJECTS CLOSED AND UNDER DEVELOPMENT

Project Name	Zhabei (Shanghai)	Hangfeng (Hebei)	Hefei (Anhui)	Rizhao (Shandong)
Sponsor(s)	GE Capital MEPC	Siemens/North China Power	Singapore Investment Corporation	Siemens/UDI
Size (MW)	4 x 100	2 x 660	2 x 350	2 x 350
Fuel Type	Fuel Oil (Conversion to Gas)	Coal	Coal	Coal
Total Cost (US\$ million)	220	1,050	560	650
Equity/Debt Ratio	25/75	25/75	25/75	25/75
Private Equity (%)	30	40	49	25
Foreign Debt (US\$ million)	124	398	236	350
Debt Sources	Commercial Banks	ECAs (85%) Commercial Banks (15%)	ECAs (58%) Commercial Banks (42%)	ECAs (85%) Commercial Banks (15%)
Debt Terms (grace, maturity, rate)	2/10/LIBOR+1.92%	4/16/6.24% 4/12/7.77%	4/15/6.6% 3/11/LIBOR+1.3%	4/16/6.28% 4/12/LIBOR+1.25%
PPA Length	15	20	20	20
Tariff Type	Take or Pay	Take or Pay	Take or Pay	Take or Pay
Minimum Hours	2,500	5,250	5,500	5,500
Tariff Level (with minimum hours)	Y 0.90/kWh	Y 0.38/kWh	Y 0.42/kWh	Y 0.46/kWh
Tariff Level (within minimum hours)	Operation Cost	Profit Sharing Formula	Profit Sharing Formula	Profit Sharing Formula
Estimated Equity Return	15%	15%	15.05%	16.8%
Fuel Supplier	SMEPC	Domestic	Domestic	Domestic
Turnkey Contractor	SMEPC	Domestic	ABB (Germany)	Domestic
Operator	SMEPC	Domestic	Domestic	Domestic

Project Name	Huhu (Anhui)	Ligang (Jiangsu)	Laibin B (Guangxi)	Qinglan (Hainan)
Sponsor(s)	AES/China Power Int. Holdings	Huayun (Hongkong)	EDF/GEC Alsthom	Enron
Size (MW)	2 x 125	2 x 350	2 x 350	150
Fuel Type	Coal	Coal	Coal	Oil
Total Cost (US\$ million)	115	436	610	130
Equity/Debt Ratio	30/70	25/75	30/70	30/70
Private Equity (%)	25	56.3	100	100
Foreign Debt (US\$ million)	83?	154	458	91
Debt Sources	Commercial Banks	ECAs	ECAs (67%) Commercial Banks (33%)	N/A
Debt Terms (grace, maturity, rate)	N/A	3/15/5.95%	4/16/6.5% 4/12/LIBOR+1%	NA
PPA Length	N/A	20	15	12
Tariff Type	Take or Pay	Take or Pay	Take or Pay	Take or Pay
Minimum Hours	N/A	5,500	5,500	N/A
Tariff Level (with minimum hours)	N/A	Y 0.34/kWh	Y 0.4665/kWh	Y 300 million/year Y 0.28/kWh
Tariff Level (within minimum hours)	N/A	Y 0.34/kWh	Y 0.233/kWh	N/A
Estimated Equity Return	N/A	15.7%	N/A	N/A
Fuel Supplier	Domestic	Domestic	Domestic	Enron
Turnkey Contractor	Domestic	Domestic	EDF	Enron
Operator	Domestic	Domestic	EDF	Enron

Project Name	Zhuhai (Guangdong)	Jingyuan (Gansu)	Puqi (Hubei)	Meizhouwan (Fujian)
Sponsor(s)	Cheung Kong Infrastructure	Community Energy Alternative	Sithe China (75%) Marbueni (25%)	InterGen (70%) Lippo (25%) ADB (5%)
Size (MW)	2 x 700	2 x 300	2 x 300	2 x 360
Fuel Type	Coal	Coal	Coal	Coal
Total Cost (US\$ million)	1,200	360	440	740
Equity/Debt Ratio	30/70	30/70	30/70	25/75
Private Equity (%)	30	30	100	100
Foreign Debt (US\$ million)	795	74	300	555
Debt Sources	ECAs (85%) Commercial Banks (15%)	Equity Holder	Commercial Banks	Commercial Banks (42%) ADB (34%) ECAs (85%)
Debt Terms (grace, maturity, rate)	4/12/5.5 4/16/LIBOR +1%	2/10/LIBOR+2%	N/A	N/A
PPA Length	20	20	20	23
Tariff Type	Take or Pay	Take or Pay	Take or Pay	Take or Pay
Minimum Hours	5,500	5,500	5,000	5,000
Tariff Level (with minimum hours)	N/A	N/A	N/A	N/A
Tariff Level (within minimum hours)	Profit Sharing Formula	N/A	N/A	N/A
Estimated Equity Return	16.9%	15%	N/A	N/A
Fuel Supplier	Domestic	Domestic	Domestic	Domestic
Turnkey Contractor	Mitsubishi	Domestic	Domestic	N/A
Operator	Domestic	Domestic	N/A	N/A

Source: Study team.

### ANNEX 3: SAMPLE CONDITIONS PRECEDENT TO LOAN DISBURSEMENT BY COMMERCIAL BANKS

1.	Loan Agreement	22.	In relation to GE Capital, Certified true copies of:
2.	Conversion Agreement Assignment		(a) its certificate of incorporation
3.	Acknowledgment from CCB regarding the Conversion Agreement Assignment		(b) its by-laws
4.	Insurance Assignment	23.	In relation to GE Shanghai, certified true copies of:
5.	Acknowledgment(s) from the Insurer(s) regarding the Insurance Assignment		(a) its certificate of incorporation
6.	Joint Venture Rights Assignment		(b) its memorandum of association and by-laws
7.	Certificates from the JV parties		(c) a list of its directors
8.	Project Contracts Assignment		(d) a list of its shareholders and their respective shareholdings
9.	Acknowledgments from GE Capital and SMEPC regarding the Project Contracts Assignment		(e) resolutions of its board of directors and the specimen signature(s) of the authorized representative(s)
10.	Creditors' Charge over Accounts	24.	Certified true copy of the Joint Venture Contract
11.	Acknowledgments from CCB and SCB, Shanghai regarding the Creditors' Charge over Accounts	25.	Certified true copy of the Turnkey Construction contract
12.	Lenders' Charge over Accounts	26.	Certified true copy of the O&M Contract
13.	Acknowledgments from CCB and SCB, Shanghai regarding the Lenders' Charge over Accounts	27.	Certified true copy of the Power Purchase Agreement
14.	Charge over Equipment	28.	Certified true copy of the Equipment Supply Contract
15.	Mortgage	29.	Certified true copy of the Interconnection Agreement
16.	Deed of Undertaking and Subordination	30.	Certified true copy of the GE Guarantee
17.	Conversation Agreement	31.	Insurance Report
18.	Intercreditor Agreement	32.	Certificate from JIB and certified true copies of the original cover notes
19.	Letter of support	33.	Cost Estimate

20.	In relation to the borrower, certified true copies of: (a) its Articles of Association (b) its current business license issued by SAIC (c) a list of its directors with their specimen signatures (d) resolutions of its board of directors and the specimen signature(s) of the authorized representative(s)	34.	Program
		35.	Insurance Program
		36.	Project Assessment Report
		37.	Progress Report
		38.	Certified true copy of SMEPC's current land use right certificate in respect of Project Site
21.	In relation to SMEPC, certified true copies of: (a) its articles of association (b) its current business license issued by SAIC (c) a written authority or power of attorney signed by its legal representative and the specimen signature(s) of the authorized Representative(s)	39.	Written confirmation from Shanghai Real Estate Administration Bureau
		40.	Evidence that the Borrower has user/access rights to the Project Site
		41.	Evidence of compliance with fuel specifications
		42.	Original insurance policies
43.	Renminbi Loan Agreement	54.	Certified true copy of the registration certificate for external debt issued by SAFE in respect of the Loan Agreement
44.	Capital verification certificates	55.	Certified true copy of the filing receipt for the Charge over Equipment issued by the Shanghai Customs
45.	Confirmation on the value of state-owned assets contributed by SMEPC	56.	Certified true copy of the registration certificate for the Charge over equipment issued by the SAIC
46.	Approval(s) from SAFE regarding the Opening of the Dollar Accounts	57.	Certified true copy of the registration certificate issued by SAFE in respect of the Charge over Equipment
47.	Approval from MOFTEC in respect of the joint Venture Contract and the Articles of Association	58.	Process agent acceptance letter
48.	Approval from the Shanghai Planning Commission in respect of feasibility study of the Project	59.	Legal opinion from Pu Dong Law Office
49.	Approval from the East China Power Bureau in respect of the feasibility study of the Project	60.	Legal opinion from Conyers, Dill and Pearman
50.	Approval from MOEP in respect of the feasibility study of the Project	61.	Legal opinion from B&M
51.	Approval from SETC in respect of the feasibility study of the Project	62.	Evidence that all stamp duties in respect of the Loan Agreement or any Security Document have been paid or waived
52.	Approval from SAFE in respect of the Facility	63.	Certified true copy of the Amendment Contract
53.	Approval from the Shanghai Customs in respect of all imported equipment charged under the Charge over Equipment		

Source: Study team.



## ANNEX 4: SELECTED SMALL AND MEDIUM POWER PLANTS INVOLVING DIRECT FOREIGN INVESTMENT

Plant	Capacity (MW)	Fuel Type	Foreign Developer	Private Interest (%)	Location
Jiangmen	100	Oil	CEA	75	Guangdong
Suzhou	72	Oil	Coastal Power	60	Jiangsu
Wuxi-Carec	40	Oil	Coastal Power	60	Jiangsu
Wuxi	63	Oil	AES	55	Jiangsu
Houjie	66	Oil	Sithe Energies	68	Guangdong
Fuling Aixi	45	Coal	AES	70	Sichuan
Upper Ming	39	Hydro	New World Power	100	Fujian
Shijiazhuang	50	Coal	National Power	70	Hebei
Xiangci	21	Hydro	AES	52	Hunan
Xinchang	24	Coal	Illinova Generation	54	Zhejiang
Yangchun	15	Diesel	AES	60	Guangdong
Yangchun II	6	Diesel	AES	25	Guangdong
Xinchange	36	Coal	Illinova Generation	60	Zhejiang
Chengdu	42	Gas	AES	35	Sichuan
Nanjing	72	Diesel	AES	40	Jiangsu
Zhenjiang	27	Coal	Power Fin	85	Jiangsu
Yongcheng	50	Coal	AES	N.A.	Hebei
Tangshan Xijiao	100	Coal	Sithe Energies	25	Tianjin
Tangshan Lannan	100	Coal	Sithe Energies	25	Tianjin
Zhenhua	100	Coal	Panda	25	Tianjin
Changyang	90	Oil	Cheng Kong Infra.	N.A.	Guangdong
Chenghai	75	Oil	Cheng Kong Infra.	N.A.	Guangdong
Tuopu	114	Oil	Cheng Kong Infra.	N.A.	Guangdong
Fushun	150	Oil	Cheng Kong Infra.	N.A.	Guangdong
Zigonangang	100	Coal	China Dev. Invest.	42	Shandong
Zibonanying	100	Coal	China Dev. Invest.	35	Shandong
Yitaihuanghai	65	Coal	China Dev. Invest.	25	Shandong
Yitaibohai	65	Coal	China Dev. Invest.	25	Shandong
Huilo	39	Diesel	N.A.	N.A.	Guangdong

Source: Study team.

## ANNEX 5: POWER COMPANIES LISTED IN STOCK EXCHANGES

Company	Installed Capacity (MW)	Capital Raised (million)	Offerings (%)	Stock Market	Date of Listing
Huaneng International	2,900	US\$600	27.71	New York	Oct-94
Shandong Huaneng	1,750	US\$330	30	New York	Aug-94
Beijing Datang	3,150	US\$450	27.71	Hong Kong, London	Mar-97
Zhejiang Southeast	1,330	US\$207.6	25	Shanghai, London	Sep-97
Shnergy	1,900	Y 240	10	Shanghai	Jun-95
Leshan Electric	N.A.*	N.A.	N.A.	Shanghai	N.A.
Dalian Power	N.A.	N.A.	N.A.	Shanghai	N.A.
Longdian A	N.A.	Y 240	12.83	Shanghai	Jul-97
B	N.A.	US\$24	32.07	Shanghai	Jul-97
Huayin Electric	N.A.	Y 390	N.A.	Shanghai	Sep-96
Xianglong Power	N.A.	N.A.	N.A.	Shanghai	N.A.
Northeast Power	N.A.	N.A.	N.A.	Shanghai	N.A.
Neimeng Huadian	N.A.	Y 200	N.A.	Shanghai	May-94
Harbin Shirble	N.A.	N.A.	N.A.	Shanghai	N.A.
Guangzhou Power	N.A.	N.A.	N.A.	Shanghai	N.A.
Mingxing Electric	N.A.	N.A.	N.A.	Shanghai	N.A.
Gezhouba	275	Y 1,200	N.A.	Shanghai	May-97
Shenzhen Energy	N.A.	N.A.	N.A.	Shenzhen	Apr-93
Shennan Electric	N.A.	N.A.	N.A.	Shenzhen	N.A.
Guangzhou Hengyun	N.A.	N.A.	N.A.	Shenzhen	N.A.
Guangzhou Huadian	N.A.	N.A.	N.A.	Shenzhen	N.A.
Shantou Electric	N.A.	N.A.	N.A.	Shenzhen	N.A.
Guangdong Power	N.A.	N.A.	N.A.	Shenzhen	N.A.
Wanneng	N.A.	N.A.	N.A.	Shenzhen	N.A.
Shaoneng	N.A.	N.A.	N.A.	Shenzhen	N.A.
Zhangze Electric	N.A.	Y 90	N.A.	Shenzhen	Jun-97

\* N.A.: Not available.

Source: Study team.





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