China's Electric Power Market: The Rise and Fall of IPPs

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About The Experience of Independent Power Projects in Developing Countries Study

Private investment in electricity generation (so called "independent power producers" or IPPs) in developing countries grew dramatically during the 1990s, only to decline equally dramatically in the wake of the Asian financial crisis and other troubles in the late 1990s. The Program on Energy and Sustainable Development at Stanford University is undertaking a detailed review of the IPP experience in developing countries. The study has sought to identify the principal factors that explain the wide variation in outcomes for IPP investors and hosts. It also aims to identify lessons for the next wave in private investment in electricity generation.

PESD's work has focused directly on the experiences with IPPs in 10 developing and reforming countries (Argentina, Brazil, China, India, Malaysia, Mexico, the Philippines, Poland, Thailand and Turkey). PESD has also helped to establish a complementary study at the Management Program in Infrastructure Reform & Regulation at the University of Cape Town ("IIRR"), which is employing the same methodology in a detailed study of IPPs in three African countries (Egypt, Kenya and Tanzania).

About the Author

Pei Yee Woo is a Research Fellow with the Program of Energy and Sustainable Development. Her current research focuses on investment issues in the global energy sector. Admitted to the Bar in both Singapore and California, she has worked as an attorney in international transactions involving infrastructure privatization, investment and financing in Baker & McKenzie (Singapore) and White & Case LLP (San Francisco). She is now a doctoral student in Stanford, and pursuing further certification as a Chartered Financial Analyst.

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I. INTRODUCTION.

This paper is part of the wider Program on Energy and Sustainable Development study on the ongoing experience of Independent Power Producers (IPPs) in developing countries that are in the midst of restructuring their electric power sectors. This paper seeks to explain the historical experience of IPPs in China and to analyze the factors leading to the general investment record and those underlying variations in investment outcomes. The ultimate objective is to provide a sound, accurate factual basis for assessing future trends in China's power market and the paths ahead for governmental institutions and investors in charting out institutional reforms and participating in investment opportunities respectively. This paper follows the research methods and guidelines laid out in the project's research protocol.[1]

For the purposes of this paper, IPPs refer to foreign-invested IPPs. This is mainly attributed to the fact that China has been a socialist country in the midst of its transition towards a market economy, and former state owned enterprises (SOEs; though corporatized) have continued to be closely tied to government funding and control. Power companies such as Huaneng Power International, Huadian or Beijing Datang, which have been considered "IPPs" by the industry for several years, have been funded (and to a significant extent, controlled) by the government and are still receiving asset injections from the State Power Corporation. As such, we will not examine projects from local generation companies ("gencos") in China, other than for the purpose of providing context and benchmarks in our consideration of foreign IPPs.

This paper starts off with a brief history of China's power market starting from the late 1980s when the power generation sector was first opened to private investment. The second section explains the role of foreign IPPs in the market, in particular, addressing why their significance has waxed and waned over the last decade. The third section discusses certain factors and developments in the investment climate of China's power market which has affected the investment strategies and operations of gencos across the board. This provides the context for an analysis of how these factors have affected foreign IPPs differently from other gencos as well as of how different foreign IPPs have structured the projects in ways leading to variations in investment outcomes. The final section will outline our selection of five case studies for in-depth treatment.

[1] Victor, et al (2004). "The Experience with Independent Power Projects in Developing Countries: Introduction and Case Study Methods", PESD Working Paper #23, available at http://pesd.stanford.edu/publications/workingpapers.html.

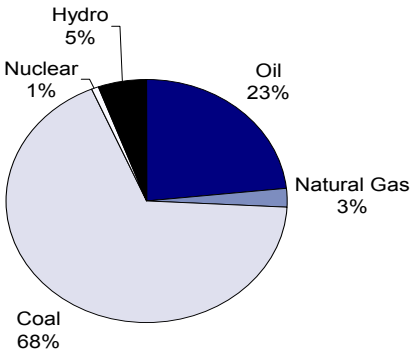
II. OVERVIEW OF CHINA'S ELECTRIC POWER MARKET.

In explaining the basic structure of China's electric power market, there are four important issues to address: (1) the primary energy consumption and fuel mix; (2) the power supply-demand situation; (3) the interconnection of regional and provincial grids; (4) the ownership structure and institutional framework of the industry.

A. Primary Energy Consumption Mix.

Coal has traditionally dominated the energy market in China. In 2003, coal represented 68% of China's primary energy consumption, compared with 23% for oil, 5% for hydropower, 2.5% for natural gas and 1% for nuclear.[2] The importance of coal is even greater in the power generation sector, accounting for nearly 75% of the overall fuel mix in 2003.

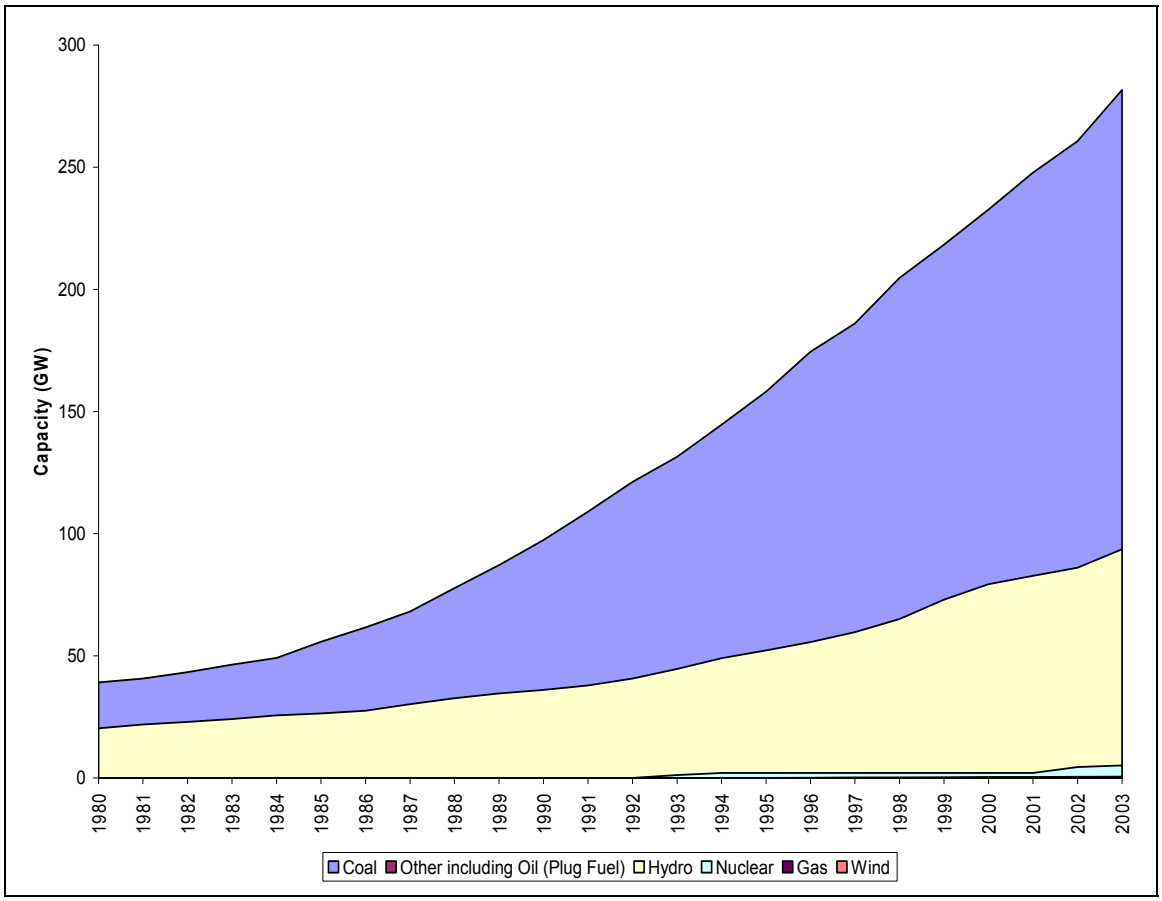
FIGURE 1: CHINA'S PRIMARY ENERGY CONSUMPTION (2003)



Source: BP.

[2] Information from conference call with China Coal Association, July 2004.

FIGURE 2: CHINA'S FUEL MIX IN TERMS OF GENERATION CAPACITY (1980-2003)

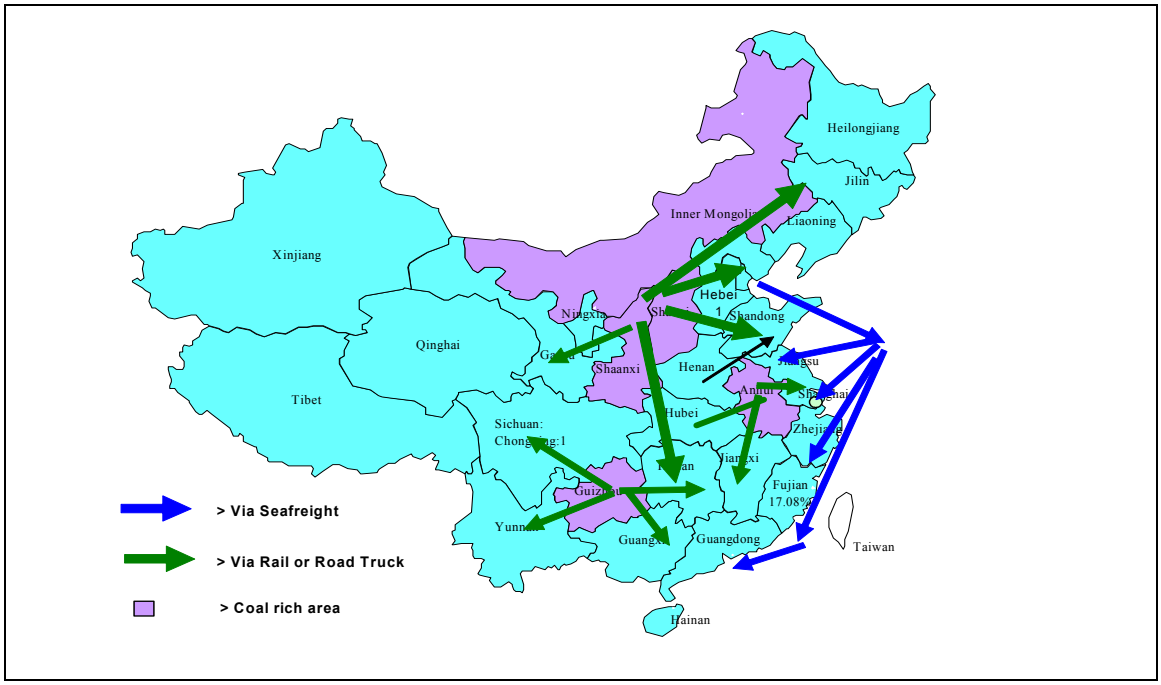


Source: State Grid Corp, journal articles and various sources.

China has been the world's largest coal producer and consumer, given its vast reserves of low-priced coal. As China's energy consumption grows in line with its robust economic growth, the country's high dependence on coal has resulted in increased levels of air pollution from SOx and NOx emissions, negatively impacting the environment. These coal reserves are concentrated in the northern and western regions of the country, putting a significant burden on the country's transportation system.[3] The resulting transportation bottlenecks can lead to higher all-in fuel costs and instability of supply, creating unique problems for IPPs situated in coastal regions.

[3] *Id.*

FIGURE 3: COAL TRANSPORTATION ROUTE IN CHINA



Source: Morgan Stanley Research

However, the current fuel mix may be shifting away from coal such that coal accounts for around 60% of total generation fuel mix in 2020. In its 10th Five Year Plan, the Chinese government formulated its clean energy policy and declared its intention to accelerate the use of natural gas for both economic and environmental reasons.[4] At just 2.5% of primary energy, China's usage of natural gas is well below the current world average level of around 25%. According to the Development Research Center of China's State Council, China plans to raise the share of natural gas in its energy consumption from the current 2.5% to 5% in 2010 and to 7% by 2020.[5] According to this forecast, natural gas consumption is expected to rise from 32.8 billion m^3 in 2003 to 251.7 billion m^3 by 2020. In order to achieve this objective, the government has planned a significant number of large infrastructure projects to bring gas to the market, including the West-East pipeline and multiple LNG terminals (among which the terminals in Guangdong and Fujian are currently under construction).[6]

B. Power Supply-Demand Situation.

The power supply-demand situation in China is a key factor affecting the outcomes of IPPs. As discussed in a subsequent section, the general investment record of IPPs have consistently resembled trends in the power supply-demand situation, despite

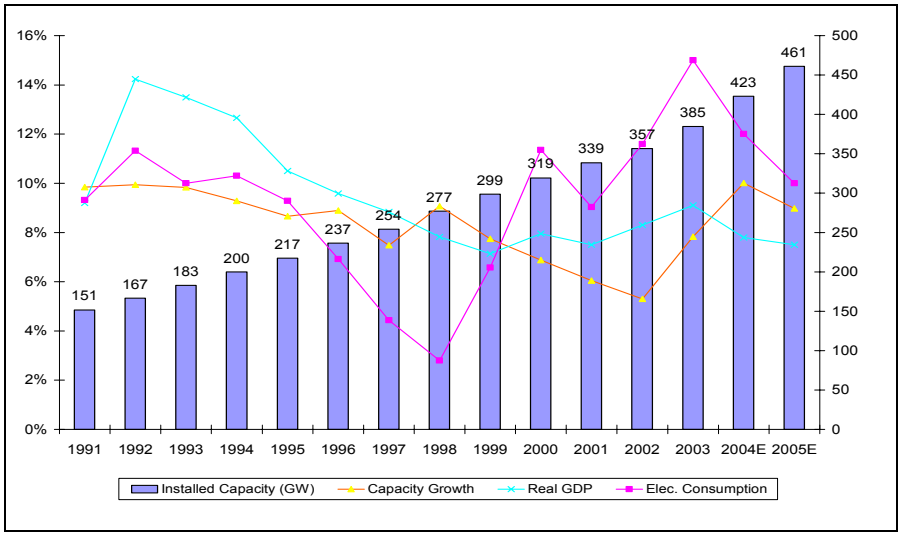
[4] Du, M., Prospect of Cleaner Energy Development in China (paper delivered at International Conference on Cleaner Production in 2001).
[5] China's Development Research Center database, available at www.drcnet.com.cn.
[6] *Id.*

the fact that IPPs tried to contract out of this market risk using offtake provisions in power purchase agreements ("PPAs").

Driven by economic growth, China's electricity demand has rapidly increased since the 1980s. Government forecasts in 1989 indicated that China would have an annual shortage of 50 billion kWh of electricity by 2000,[7] and by some accounts, the shortage was retarding industrial production at a rate of 20-40 percent.[8] The response to the power shortage bottleneck can be seen in Figure 4 – between 1991 and 1994, annual installed capacity growth was around 8%, while consumption growth was above 10%. In 1994, the Ministry of Electric Power estimated the supply deficit at 300GWh of installed capacity by the year 2000.[9]

However, electricity consumption growth unexpectedly started on a downward trend after 1994, dipping to a low of 2.8% in 1998. Over that period, installed capacity growth remained at a fairly constant level, reversing the power shortage situation.

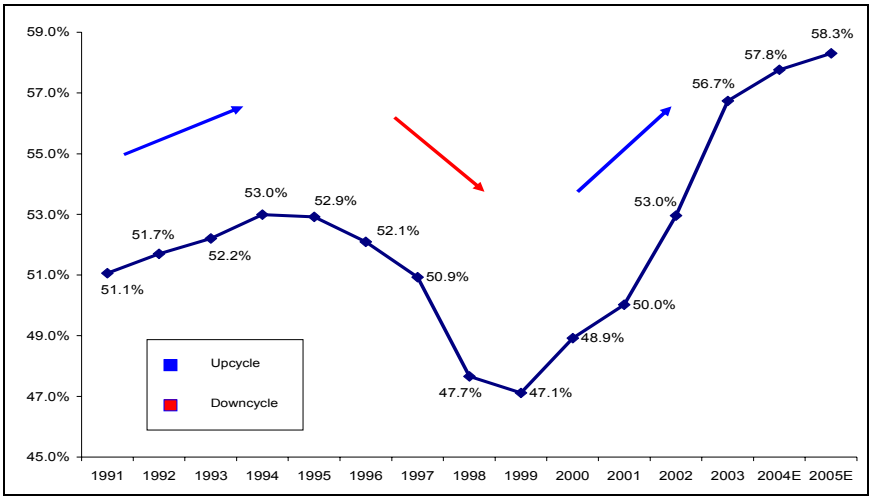
FIGURE 4: CHINA'S POWER SUPPLY-DEMAND BALANCE



Source: Morgan Stanley Research

[7] *Power shortages in China*, ENERGY ECONOMIST, Dec 1, 1989.
[8] Schneider, David, *Power Plays*, CHINA BUS. REV. Nov-Dec 1993, at 20.
[9] *Energy Market Report: Electricity*, ENERGY ECONOMIST, Apr 1, 1994.

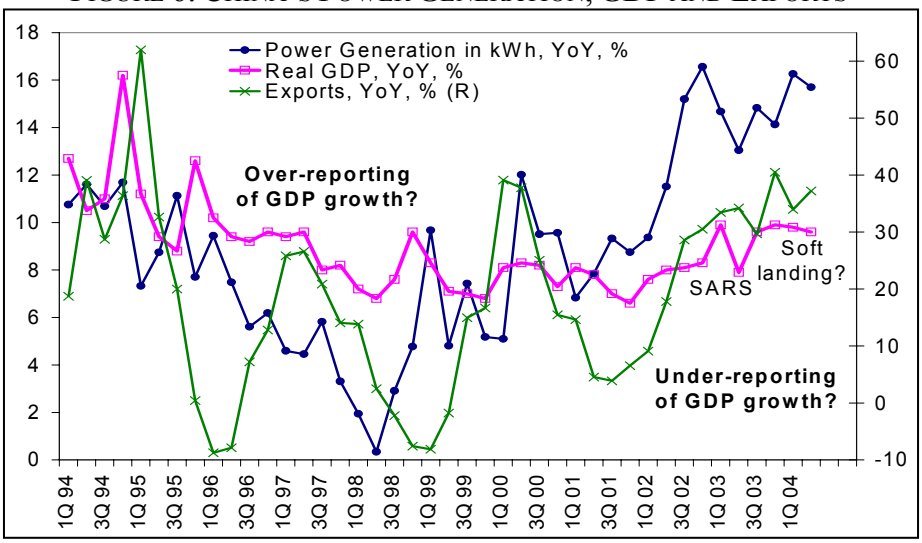
FIGURE 5: CHINA'S CAPACITY FACTOR



Source: Morgan Stanley Research

This situation is attributed to a combination of factors. First, a significant amount of electricity efficiency gains and savings occurred due to the cumulative effects of a shift in the power consumption structure owing to China's market restructuring and energy conservation policies.[10] Second, a decrease in energy consumption was brought about by slower economic growth, possibly due to the Asian Financial Crisis. While China was relatively unaffected by the currency problems afflicting other Asian countries, the economic slowdown in the region could have affected the amount of foreign direct investment into and exports from China. The actual impact of the crisis on China could have been masked by over-reporting of GDP growth figures.

FIGURE 6: CHINA'S POWER GENERATION, GDP AND EXPORTS

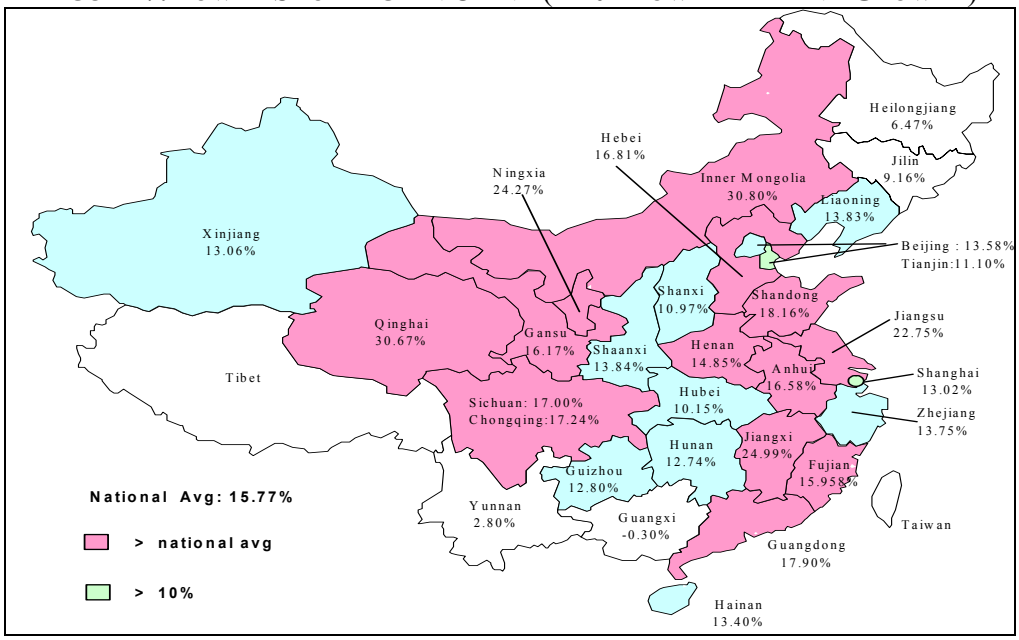


Source: Morgan Stanley Research

[10] For a detailed discussion of these effects, *see* Sinton, Jonathan E. and David G. Fridley, Hot Air and Cold Water: The unexpected fall in China's energy use, *China Environment Series, Issue 4*, 2001; Working out the Kinks: Understanding the Fall and Rise of Energy Use in China, *Oxford Energy Forum, May 2003.*

A reverse in the supply-demand situation started in 2001, as China's economy strengthened and state planners restricted the number of approvals for new power projects. This gradually worsened into a national power shortage in late 2003, with most provinces (with the notable exception of the Shandong province) suffering blackouts or scheduled outages. In the first half of 2004, the power shortage problem seems to have continued unchecked, with twenty-four provinces curtailing supply availability through power rationing and demand side management measures which compelled industrial users to shut down or reschedule operations.[11] A recent government estimate puts the national capacity shortage during peak hours this summer was as high as 33.5GW, translating into a negative reserve of 8%.[12] In most developed economies, planners target a minimum positive reserve margin of 15-20%.

FIGURE 7: POWER SHORTAGE IN CHINA (1H04 POWER DEMAND GROWTH)



Source: Morgan Stanley Research

C. National Grid Interconnection.

The operation of the transmission and distribution ("T&D") network typically plays a key role in load balancing. Despite its significance, upgrading and expansion of China's power delivery network has consistently lagged behind the development of generation capacity (in Table 1, below, China ranks near the bottom of the chart for its transformer capacity per capita, line losses and system minutes.)

[11] See, for example, media accounts such as, *China's power shortage to aggravate in 2004*, Xinhua News, February 25, 2004.
[12] Morgan Stanley Research (August 2004).

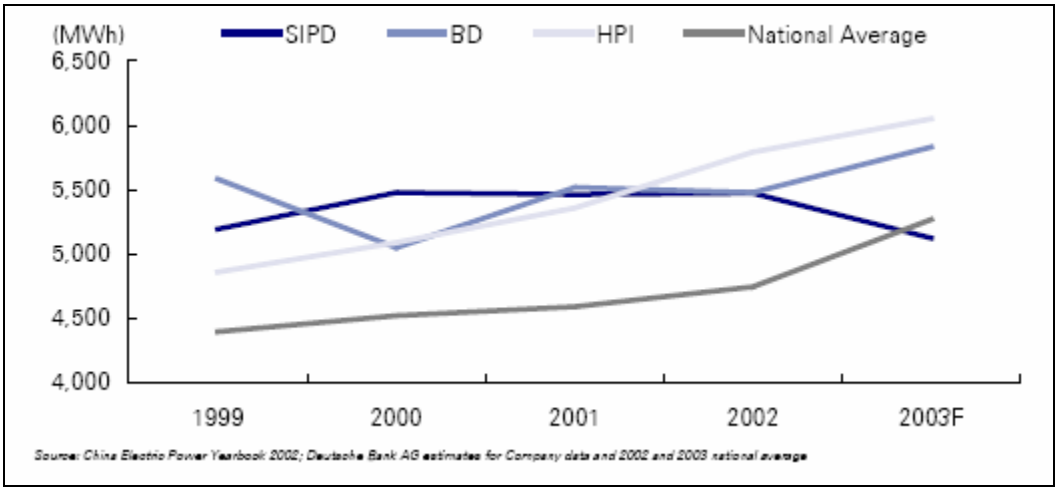
TABLE 1: COMPARISON OF THE ADEQUACY OF THE GRID IN ASIA

Grid	MVA per Capita	Line Losses	System Minutes
Singapore	1	2	2
Hong Kong	2	3	1
South Korea	3	4	3
Malaysia	4	9	4
Taiwan	5	6	6
Thailand	6	1	5
China	7	6	7
Philippines	8	7	9
Indonesia	9	8	8

Source: Lehman Brothers Research (2002)

As a result of such poor T&D network, each provincial/regional power grid typically constitutes an "isolated market". Capacity surpluses cannot be spread (through inter-provincial exports) to areas in need of power, making IPPs highly susceptible to regional fluctuations in supply and demand. This is a key factor affecting investment outcomes. For example, in the Shandong province, capacity additions of close to 20% in past 2-3 years have led to excess supply capacity. Shandong's reserve margin is now around 50% whereas the national reserve margin is estimated to be historically low at about 4%.[13] This situation is accompanied by low utilization rates of gencos and IPPs. However, this situation may be change in future, with China's "West-East Power Transmission" project. Under this project that requires large-scale grid expansion and upgrading, electricity produced from the fuel-rich western regions is planned to be transferred to the demand-intense east coast regions.

FIGURE 8: UTILIZATION RATES OF SHANDONG INTERNATIONAL POWER DEVELOPMENT (SIPD), BEIJING DATANG (BD), HUANENG POWER INTERNATIONAL (HPI), AND THE NATIONAL AVERAGE



Source: Deustche Bank AG Research (2003).

[13] Morgan Stanley Research (August 2004).

D. Industry Ownership Structure and Institutional Framework[14]

Before 1985, the electric power industry was tightly controlled and monopolized by the central government through the Ministry of Electric Power and Water Resources Utilization ("MOEPWRU"). All private investment in China's power industry was prohibited. The 1978 "Open Door Policy" in China began economic reforms and eroded political barriers to the privatization of power generation facilities. At the same time, rapid economic development led to a tremendous increase in electricity demand, which was not met by governmental investments in electricity generation. Thus, in 1985, the "Provisional Regulations on Encouraging Fund Raising for Power Construction and Introducing Multi-rate Power Tariff" were passed, removing the exclusive monopoly of the central government over investment in the power industry, allowing autonomous investment by sub-national governments, private enterprises and foreign companies. In 1988, the MOEPWRU was split into the Ministry of Electric Power ("MOEP") and the Ministry of Water Resources Utilization. At the same time, the government decided to institute a separation of governmental and business management functions through establishing regional and provincial power companies alongside respective power bureaus.

Despite these reforms allowing for diversification of investment and corporatization of state-owned power companies, the heavy hand of the Chinese government continued to hold sway over the sector. Power plants owned by the government through its regional and provincial power companies, as well as municipalities and counties, dominated the generation market. To a significant extent, the functions and decisions of these gencos were controlled by the State Planning Commission, which planned development strategies and capital investment, and implemented these plans by dispensing government appropriations and loans to the gencos through the MOEP.

However, a new wave of reforms started in 1997 with the establishment of the State Power Corporation ("SP") and the dismantling of the MOEP. This was an interim measure aimed at separating governmental and business management functions, and moving towards an efficient, competitive power generation market. In 2003, the SP, which controlled 49.5% of installed capacity,[15] was broken up into five major generation companies - see figure below. Additionally, 6,470MW of installed capacity will be allocated to the State Power Grid Company to finance power grid development (by disposing of these assets in the next two to three years), and another 9,200MW will be assigned to a new company that will cover non-core businesses.

[14] See, generally, van Sambeek, E., The Institutional Framework of the Chinese Power Sector (2001) for a detailed treatment of the historical reforms of China's power sector.
[15] ABN Amro Research (February 2004).

TABLE 2: CHINA'S NEW INDUSTRY STRUCTURE (AS OF DEC 2003)

Regional Company	Generation Holding Companies			
	Parent	**Installed Capacity**	**Listed Arms**	**Auxiliary Services Companies**
State Power Grid Corp.	China Huaneng Group	38 GW	Huaneng Power International; Zhejiang Southeast	China Power Engineering Consulting Group
	China Datang Group	32 GW	Beijing Datang; Guangxi Guiguan; Hunan Huayin	China Hydropower Engineering Consulting Group Corporation
China Southern Power Grid Corporation	China Huadian Group	31GW	Huadian; Longdian Holdings	China Water Resources & Hydropower Construction Group
	China Guodian Group	31 GW	SP Power Development; Hubei Changyuan	Gezhouba Group
	China Power Investment	29 GW	Shanxi Zhangze; Chongqing Jiulong	

Source: SPC (2003).

Apart from this sea change in ownership structure, a new industry regulator was established - the State Electricity Regulatory Commission ("SERC"). Its key responsibilities are to monitor the power market, maintain fair competition and initiate power pooling.[16] Preliminary power pooling tests have been launched in various provinces, but progress has been delayed by the national power shortage. In 2004, an advanced round of power pooling tests has just started in the Northeast China Power Network involving the Heilongjiang, Jilin and Liaoning provinces.

III. FOREIGN INVESTMENT IN CHINA'S ELECTRIC POWER INDUSTRY

A. The Growth of FDI in China's Power Sector.

The first foreign-invested power project in China kicked off with negotiations in the early 1980s between the Guangdong provincial government and China Light and Power Co. Ltd ("CLP") of Hong Kong. The parties eventually undertook the joint development of a nuclear power plant (Daya Bay) which supplied electricity to both Hong Kong and Guangdong. This pilot experience encouraged negotiations between the Shenzhen municipal government and Hopewell Holdings Ltd of Hong Kong for the joint development of a coal-fired power plant (Shajiao B). After numerous discussions and meetings with governmental agencies, parties finally signed the joint venture agreements for this project in 1985.

[16] See details in *Establishment of a State Electricity Regulatory Commission in China: A Suggested 'Roadmap',* World Bank working paper (2002).

Despite some hiccups at the turn of the decade,[17] a phase of dynamic expansion began after Deng Xiaoping's 1992 tour of Southern China – the location of the new Special Economic Zones which were the stage for China's experiment with greater market orientation. Deng's speech on economic reforms and the further opening up of the country to the private sector renewed the interest of foreign developers. The result was the signing of more than 100 Memoranda of Understanding for private participation in the industry.

Figure 9 below indicates the trend of foreign investment in China's power generation sector. From 1994 to 1997 (the boom period), there was a dizzying surge in foreign investment. In this period, the Chinese government made important commitments to foreign-invested projects, approving even those which envisaged full foreign control over the plant. It also introduced the state-sponsored BOT program, culminating in the Laibin B project. In 1997, which the graph shows to be the watershed year, a number of mammoth projects moved towards financial close – the 600MW Jingyuan II in Gansu, 700MW Laibin B in Guangxi, 400MW Shanghai Zhadian, 3100MW Meizhouwan, 3000MW Shandong Zhonghua, 700MW Shandong Rizhao, and 2100MW Shanxi Yangcheng.

During this boom period, the growth in foreign investment was tremendous, and the electric power sector attracted more foreign investment than any other industry in China.[18] Before 1985, cumulative foreign investment in China's power sector stood at zero, while in 2002 it made up 13 percent of the total investment in the Chinese power.[19] This is double the proportion of foreign investment in capital construction in China across all sectors – which stood at 6 percent in 2001.[20]

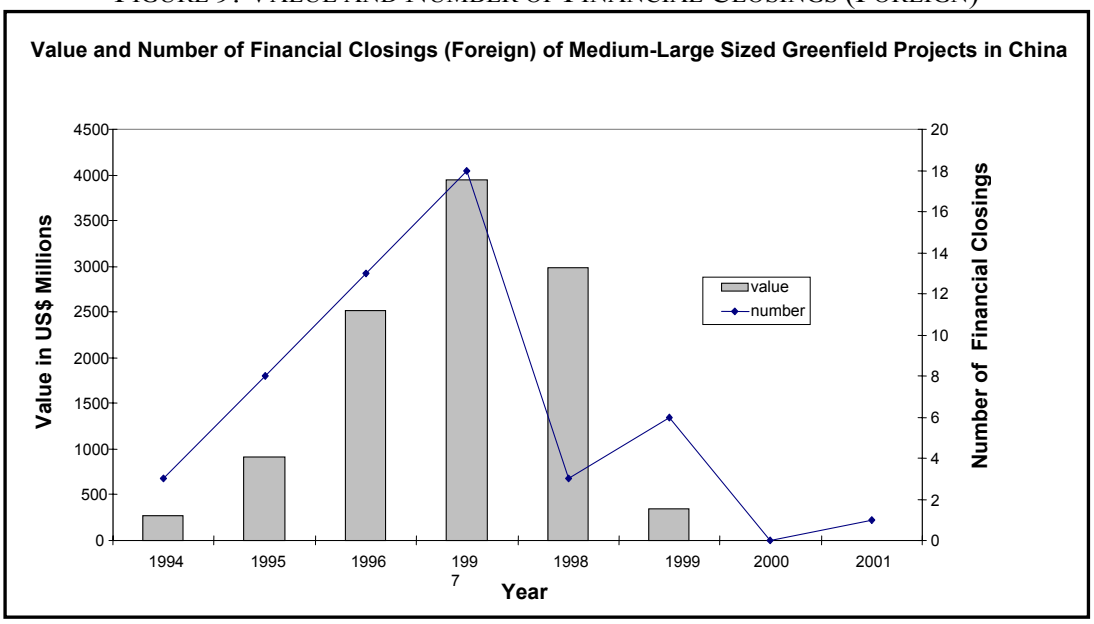
[17] These initial hiccups were caused mainly by the Tiananmen Square incident, changes in governmental policy to impose strict caps on returns by investors in the wake of the Shajiao B project and Chinese requirements that Chinese investors must have a majority stake in key projects, i.e., any plant with a single unit of 300MW or total capacity at or above 600MW (Interim Provisions on the Use of Foreign Capital in Power).

[18] Chow, Daniel, *An Analysis of the Political Economy of China's Enterprise Conglomerates: A Study of the Reform of the Electric Power Industry in China*, 28 LAW AND POLICY IN INTERNATIONAL BUSINESS 380, 385 (1997).

[19] Based on figures from the State Power Company (2002).

[20] See STATE STATISTICAL BUREAU OF CHINA, CHINA STATISTICAL YEARBOOK of various years.

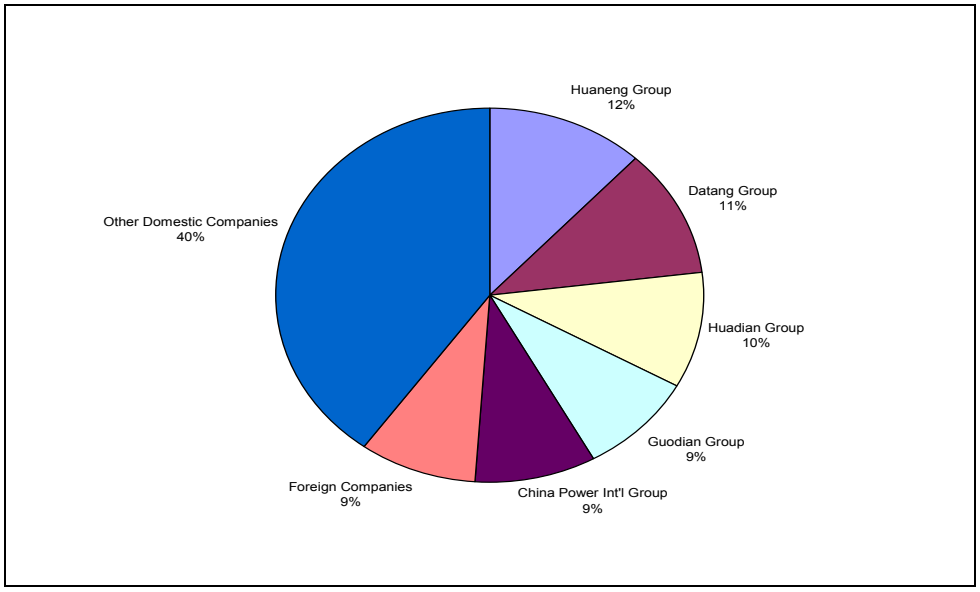
FIGURE 9: VALUE AND NUMBER OF FINANCIAL CLOSINGS (FOREIGN)



Source: World Bank Database

Just as remarkable as the foreign frenzy in the boom period is the precipitous drop-off in foreign investment, beginning in 1998 and bottoming out in 2000, with no new projects reported at all. Currently, foreign IPPs account for barely 9% of installed capacity in China's power sector, and this share is set to decline further as remaining foreign IPP investors such as Intergen and AES exit the market.[21]

FIGURE 10: INVESTOR MIX IN CHINA'S POWER INDUSTRY



Source: State Power Information Center

[21] Investors who have already exited include Sithe (in the sale of its plants to China Resources Power), Mirant (in the sale of Shajiao C) and, more recently, Siemens and Vattenfall. See, for example, *Siemens & Vattenfall Exit Chinese Power Plant*, FINANCIAL TIMES, January 4, 2005.

B. China's Need for Foreign Participation in the Power Sector in the 1990s.

The need for foreign capital was the primary motivation underlying China's welcome of foreign investment in the power sector. The other motivating factors involve the need for foreign technology transfer, and to a lesser extent, the aim to enhance efficiency in a government-dominated sector through the introduction of some competition.

1. *Foreign Capital*.

In 1994, the Ministry of Electric Power outlined the vast market for foreign capital to fund power generation investments: "China can fulfill about three-quarters of the new business [which includes rehabilitation programs for existing plants] internally, leaving $25 billion for foreign suppliers; such help will be welcomed, provided it is accompanied by *foreign finance*."[22] Indeed, it has been commented that "foreign firms provide the capital, the most expensive kind – equity financing".[23]

This need was borne out of a tight fiscal situation in China at the time of investment.[24] In the 1980s, market reforms fueled an overheating of the economy, with inflation reaching an annualized rate of 80 percent.[25] The Chinese government responded by tightening controls on credit in 1988, and again in 1992.[26] With inflation rates continuing at high levels (27.4 percent in 1993 and 27.7 percent in 1994), China announced that it would adopt a tight monetary policy during the 9th Five Year Plan (1996-2000). Under this monetary policy, banks had targets to control credit expansion, and there were strict controls on lending for new projects (especially construction projects). This not only seriously affected the appetite of SOEs for investment in infrastructure but also stifled, to some extent, the growth of other local private investment in this sector. Without access to loans from state banks, private firms often had to rely on SOEs, which borrowed from banks at the prevailing interest rate of over 10 percent and on-lent, occasionally at rates of up to 40 percent.[27] Furthermore, China's public external debt balance already exceeded $80 billion at the time of the release of the 9th Five-Year Plan[28] and the power sector was competing against other vital sectors for scarce capital. Under these pressures, foreign-funded BOT projects were extremely popular with the central and provincial governments, as they were arrangements that eased the burden of

[22] Italics were added. One may wonder at how the Ministry of Electric Power arrived the 75:25 ratio. We were told by a World Bank personnel that this could have come from a workshop organized by the World Bank in the early 1990s. It was an estimate based on the funding available in China (considering that there were other equally important sectors demanding funding as well) at that time.
[23] HUANG, YASHENG, *SELLING CHINA* (2003), at 84.
[24] *New plans to ease power shortages, says energy chief, POWER* ASIA, Dec 4, 1989.
[25] *Return to Go*, THE ECONOMIST, Jul 4, 1992.
[26] *Beijing Reportedly Tightening Controls on Credit*, JAPAN ECONOMIC NEWSWIRE, Sep 27, 1992.
[27] *Chinese official calls for rate hike*, UNITED PRESS INTERNATIONAL, Nov 25, 1994.
[28] *China Opens The Door, available at* http://www.pnl.gov/china/botlaw.htm (Accessed April 2, 2003).

the huge initial capital outlay with a delayed payback, spread over a long concession period by consumers (most likely industrial enterprises producing goods for export).[29]

2. *Technology Transfer*.

In discussing expertise and technology, we are referring more to efficient power generation equipment than to acquiring the latest technology in power generation. Energy efficiency was a governmental priority in the 1990s. A 1994 report on energy efficiency prepared by the Ministry of Electric Power in partnership with the United Nations and World Bank included ambitious energy efficiency targets.[30] The Chinese government planned to increase the average thermal efficiency of power generation to 33 percent by 2000 and 35 percent in 2010 by discouraging the building of small plants, and using advanced technology to introduce high-efficiency units, and retrofit or eliminate low-efficiency units.[31] Moreover, the Ninth Five Year Plan (1996-2000) set forth a number of specific energy efficiency strategies including the replacement of 8 GW of small units with 12 GW of large ones and encouraging the diffusion of cogeneration and advanced generating technologies.

Part of the plan included bringing in foreign investors to meet these targets with efficiency gains through foreign equipment. This is because the equipment used in Chinese plants was relatively inefficient. A report suggests that in the late 1980s to early 1990s, many 200 MW Chinese units had heat rates 10 percent higher than comparable sets made in industrialized countries.[32] The percentage of electricity generated used internally in Chinese thermal plants in 1995 still averaged 8%, about 3-4% higher than the average in developed countries.[33] Moreover, industry participants referred to: (1) the higher availability of foreign-invested plants, estimated to be typically more than 90 percent, as compared to an average of 75 percent for Chinese plants; and (2) the higher utilization hours of those plants, normally around 7000-8000 hours, as compared to 5500 hours for their local peers.

3. *Introducing Competition*.

A motive for restructuring power sectors worldwide has been to increase economic efficiency, and popular economic policy suggests that the best solution to increase efficiency is through making markets competitive. In China, the introduction of IPPs selling to a single buyer in the province (i.e., the regional or provincial power bureau) was considered the least disruptive way of introducing competition, because this would not change the basic structure of the vertically-integrated power market. However,

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[29] Tam, C.M., *Features of Power Industries in Southeast Asia*, 13 INT'L J. OF PROJECT MGT 303, 305 (1997).
[30] Allen Blackman & Xun Wu, *Foreign Direct Investment in China's Power Sector: Trends, Benefits and Barriers,* (1998) (Discussion Paper No 98-50, Resources for the Future).
[31] Li, B. and J. Dorian, *Change in China's Power Sector*, 23 ENERGY POLICY 619, 626 (1995).
[32] Sathaye, J., *Economics of Improving Efficiency of China's Electricity Supply and Use: Are Efficiency Investments Cost-effective?,* (1992) (Paper prepared for the World Bank and presented at the Coal Utilization Workshop)
[33] STATE STATISTICAL BUREAU OF CHINA, YEARBOOK OF ELECTRIC POWER IN CHINA (1995).

unlike the above two objectives which were achieved to some extent, the benefits of competition had not been reaped. This is mainly attributed to two factors: (1) it is difficult for competition to occur without a functional separation of the different stages of utility activities (generation, transmission and distribution), especially where these activities are concentrated in the hands of governmental bodies and incumbent government-related gencos with huge unregulated market share; (2) an important ingredient for the introduction of competition is the requirement that all gencos have fair and equal access to the transmission system, but industry players told us that fair dispatch has not occurred in reality.

C. China's Power Sector – Once an Attractive Destination for Foreign Investors.

During the 1990s, the principal drivers of international investment from a firm's perspective were an interest in high returns and a need for diversification from their home markets. Among emerging markets, China holds a unique attraction for foreign investors, being the largest and fastest-growing market with prospects for high rates of return. China's real gross domestic product has expanded at an average of 9% a year for the past two and a half decades to $1.4 trillion, creating the world's sixth largest economy in an amazingly short amount of time. Foreign investors often quote China as having 1.3 billion consumers, and with urban incomes growing 14% a year since 1978, often think that great numbers of unserved customers are there for the taking. In terms of investing in the power industry, this translates into confidence that the power supply-demand situation will not turn against their favor.

Nonetheless, this assessment of the investment climate in China is questionable. Take the following statistics: car sales are up 75% in 2003, and yet China still has only 15 cars per 1000 people, compared to 700 in the United States.[34] These macro numbers are gross aggregates that mean nothing at the level at which businesses operate, nor do potential customers translate automatically into profits for foreigners. The fact is that at the individual level, most Chinese still do not have much spare income, having lost state provision for unemployment and health care. GDP per person is only slightly over $1000. Growth rates are high due to a low starting base as well as large amounts of injected capital from foreign investors themselves (more than $1 billion a week flows into China as FDI) and a very loose monetary policy. In China, returns on capital are extremely low. According to Paul Heytens and Harm Zebregs of the IMF, "three-quarters of China's growth comes from capital accumulation, yet total factor productivity—a measure of overall economic efficiency—rose by only 2% a year in 1995-99."[35]

However, hype and investor sentiment masked many of the risks of investing in China. It is possible that this sentiment was even more irrational in the power industry, given that foreign IPPs were armed with long-term PPAs. These PPAs, like a form of insurance, can lead to moral hazard, i.e., investors being less careful with due diligence

[34] The Economist, March 24, 2004.
[35] The Economist, March 18, 2004.

where they thought they have reduced exposure to risk.[36] Moreover, there are often collateral reasons driving foreign IPPs to enter China's power industry. These are less politically correct reasons leading to the investment decision where some collateral motivations of a party involved in the project was the priority, not the long-term profitability of the project (*see below*).

First, not every foreign investor invested in Chinese power projects with the sole intention of profiting as a developer. Some foreign companies committed equity financing to power project companies partly to win the competitive bid for the equipment supply contract or EPC construction contract.[37] This trend is partially obscured because the development arm of such companies will normally say that their investment decisions are independent of the EPC contract or equipment supply decision. Another argument justifying the presence of the EPC contract to an associated company/subsidiary is that this gives them sufficient engineering and construction scope to assure control over the execution of the project. Nonetheless, the original rationale for the establishment of the development arm of a supplier or contractor boils down to the provision of a catalyst for their core business.

Second, decisions were sometimes driven not by a long-term strategic plan, but rather by organizational politics and dynamics. During the heady days of the early to mid-1990s, senior management swept up in the hype over the China Dream often gave their negotiators marching orders to complete a certain number of projects by the end of the year.[38] Needless to say, that put the negotiators in a "pro-project acceptance" position. In some cases, the "troops" went ahead with a deal even though they knew that it was going to be a loser rather than buck senior management.[39]

In other cases, some managers saw China as a good place to advance their careers and aggressively pursued projects. To some extent, this might have been the result of a deal-driven corporate culture in which the dealmakers get the rewards, even though others have to pick up the pieces later. Moreover, during the long-drawn negotiation and approval process for power projects, they might have come to realize that the project was likely to end up losing money. However, having spent much time and costs on it, they naturally were reluctant to account to the head office for wastage of development costs (which we have found to be quite substantial earlier) or admit that the risks were not discovered at an earlier stage. This is especially so when they were the main advocates

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[36] BRENNAN, TIMOTHY, KAREN PALMER AND SALVADOR MARTINEZ, *ALTERNATING CURRENTS: ELECTRICITY MARKETS & PUBLIC POLICY* (2002), at 55.

[37] This phenomenon has been documented by many commentators. See for example, MORAN, THEODORE (ed), *MANAGING INTERNATIONAL POLITICAL RISK*, (1998); WELLS, LOUIS, *GOD AND FAIR COMPETITION: DOES THE FOREIGN DIRECT INVESTOR FACE STILL OTHER RISKS IN EMERGING MARKETS?,* at 33; HINES, MARY, *THE DEVELOPMENT AND FINANCE OF GLOBAL PRIVATE POWER* (1997), at 85. This theme was noted extensively in interviews conducted as part of this study. For example, an investment banker had remarked that in some cases, "most of the return on equity was made early during project construction rather than during project operation!" Another advisor to projects commented, "There is always a tension in projects in which EPC contractors have an equity stake because it is true that most look to their EPC contract earnings for their returns and are not enthusiastic owners after the plant is completed".

[38] *Studwell, J., The China Dream: The Quest for the Last Great Untapped Market on Earth* (2002).

[39] *Id.*

for the project in the first place. Rather than risk the immediate fallout, some would have opted to postpone the day of reckoning in the hope that the company might miraculously turn out to make money or at least that intervening factors would prevent the blame from being placed on their shoulders. Furthermore, given the regular staff turnover in some multi-national corporations, a few managers could have foreseen that the mistake would not be revealed until they had advanced their career somewhere else. Moreover, some interviewees told us about the possibility of some managers who insisted on "making deals, not breaking them", in order to profit from "closing bonuses".

IV. ANALYSIS OF THE IPP EXPERIENCE IN CHINA.

This section will paint with a broad brush the factors affecting the outcomes of foreign-invested power projects in China. A comprehensive analysis will be furnished in a later working paper, upon completion of in-depth case studies (see selection in the next part). These factors are divided into two categories:

- **Category A:** These are factors that affect gencos across the board in China.
- **Category B**: These are factors that primarily affect foreign IPPs.

Before proceeding, it is important to note that there are a rare handful of foreign IPPs which have managed to survive China's power market because of the way they have structured the project and made critical decisions. This issue will be dealt with in our in-depth treatment of case studies. Our preliminary selection of such cases includes Mirant's Guangdong Shajiao C and Meiya Power Company's Gansu Jingyuan projects.

A. Category A: Factors Affecting All Generation Companies in China.

1. *The Supply-Demand Situation*.

Within Category A, this is probably the most significant factor affecting the outcomes of gencos across the board. Given China's poor inter-provincial grid connection, the local supply-demand situation is extremely significant in determining the number of utilization hours and the amount of generation output - which bear on revenues of IPPs.

An example of how this factor affects local gencos across the board is given through a benchmarking exercise based on the performance of coal-fired plants owned by Huaneng Power Int'l (in operation since 1997) - see Appendix B. Huaneng is chosen as a benchmark as it is a local generation company with high quality generation assets, which is listed in Hong Kong and Shanghai and has issued ADRs on the NYSE.

A quick glance at the operating statistics in Appendix B will show lower numbers for gross generation and capacity factor between 1998-2000. That period of time saw a decline in national capacity factor to its low point in 1999, where it was 47%, as compared to the current 58%. For example, in Fujian (which was considered a province

with one of the highest economic growth in the country), the capacity factor for Huaneng's Fuzhou plant dropped from 67.9% in 1995 to 60.5% in 1998, before falling further to 57.1% in 2000. As for Liaoning, which is home to many heavy industrial users and top electricity consumers, the capacity factor for Huaneng's Dalian plant was at a low 52.9% and 53.6% in 1999 and 2000 respectively, compared to 64% and 69.1% in 1995 and 2003 respectively. In addition, a stark contrast can be seen between the annual utilization hours in 1999 - where the range was 4000-5000+ and 2003 - where the range was 5000-7000+.

2. *Regulation of Tariffs*.

China's administrative framework in relation to tariffs presents unique challenges for genco's in the country, and particularly for the foreign IPPs. The key aspects of this regulatory structure are detailed below:

(a) Administrative tariff review.

An annual tariff review exists whereby components of the average tariff for each plant is approved annually by the provincial pricing bureau upon the developer's submission of a "tariff proposal".[40] Given this system, the grid/offtaker effectively has no *locus standi* to agree to or honor tariff provisions in PPAs or the less formal contracts signed with local gencos. In an arbitration case brought by a foreign IPP, it was held that the offtaker (which was the Provincial Power Bureau) had the authority to agree to the minimum offtake,[41] but not the tariff provisions.[42] These confirmed that agreed tariffs or tariff protocols do not bind the counterparty, and are subject to the discretion of the Provincial Pricing Committee.

(b) "Provisional" tariffs.

Besides the tariff review which can lead to annual adjustments in tariffs, there is the concept of "provisional tariffs". After a plant starts operation, but before it reaches COD (i.e., during the testing period), it obtains "provisional tariffs" which are of a low level and sufficient to cover operating costs alone. The rationale behind this is to keep end-user tariffs stable and allow time for adjustments. However, this is an easily abused system, where the local power bureau may delay the declaration of COD and/or the approval process for formal tariffs.

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[40] One of the most important legislation governing PPAs is the "Ministry of Power Industry, Standardizing Administration of Power Purchase Contracts Tentative Procedures". Part 3 of this document provides for the approval of electricity prices by the relevant power price administration departments. For a sense of the legal framework applicable to projects in the 1990s, see Lam, Joseph and Carmen Kan, *The Legal Framework of Foreign Investment and the Latest Regulations relating to Chinese Power Projects*, 14(9) J. INT'L BUS. LAW. 300 (1999).

[41] As an aside, foreign investors occasionally suffer from a reduction in their offtake volume as well. This issue belongs to the realm of renegotiations of PPAs (given that minimum offtake obligations are generally considered binding on the offtaker.

[42] For reasons of confidentiality, the identity of the parties involved in this arbitration cannot be revealed.

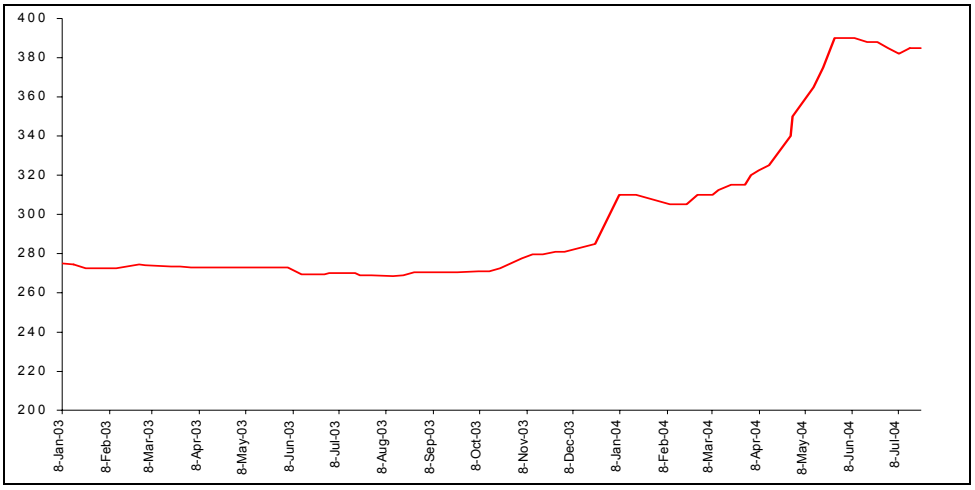
(c) "Excess" tariffs.

Under another concept in the administrative framework, electricity output beyond the "planned" quantity is charged under an "excess tariffs" framework, rather than under the normal tariffs. Like other forms of tariffs, these require approval from the authorities and are typically lower in level. This administrative framework provides a lot of flexibility for tariff reductions and can potentially open the door to arbitrary changes, which can affect the performance of gencos across the board. A good example is the series of reductions in generation tariffs in Guangdong in 2002, which formed part of a change in the tariff regime and tariffs rationalization exercise. According to the provincial government, the rationale is: under the old tariff regime since 1985, higher tariffs are allowed for the purposes of debt repayment in the first 10-12 years of plant operation.[43] However, the new tariff regime since 2001 disallows front-loaded debt allowance and establishes uniform price based on 20-year operating period. Tariffs are benchmarked against plants of similar technology within the same grid. In this sense, most of the gencos, except the ones with old plants which are already receiving low tariffs, were affected by the tariff reductions.[44]

3. *Rising Costs*.

Rising coal costs affect gencos across the board, since coal accounts for about 50-60% of total operating costs. Spot prices for Qinghuangdao coal, the most widely tracked benchmark for thermal coal, have increased by 42.6% since June 2003.[45] This sharp increase in coal costs, both domestic and international, and coal-related transportation costs has put enormous pressures on the profit margins of local gencos.

FIGURE 11: SPOT COAL PRICE AT QINHUANGDAO PORT (RMB/TON-FOB)



Source: China Coal Market Website

[43] Morgan Stanley Research (2004).
[44] *Id.*
[45] Statistics drawn from China Coal Market database.

In addition, equipment costs in general may be on the rise, given that the current low profitability of equipment manufacturers is unlikely to be sustainable. Already, according to Goldman Sachs, capital equipment costs have risen 15% to 20% in the last six months and that production capacity for power generation equipment is close to 100% utilized. Escalating steel prices will probably aggravate the situation.

This factor of rising costs is discussed for the sake of completeness, as it is theoretically a factor affecting the outcomes of IPPs. However, it did not constitute a significant factor in the IPP experience during the period since the late 1990s. This is because coal costs remained stable until mid-2003.

B. Category B: Factors Affecting Primarily Foreign IPPs in China.

Distinct from the Category A factors described above, which affect most or all gencos in China, Category B factors affect foreign IPPs only. The thread underlying Category B factors is that foreign IPPs entered China's power industry with the expectation that it would be a regulated market of long-term PPAs, cost pass-through mechanisms and guaranteed returns. It turned out that China's power industry has been, in fact, a merchant market distorted by local protectionism and fluctuating government policies.

This creates a mismatch of expectations, which partly made outcomes to foreign IPPs appear worse than those of local gencos. The mismatch in expectations was driven in two major ways. First, PPAs turned out to be difficult to enforce owing to the weak rule of law in China. Second, while foreign IPPs were banking on some hope of government support – both in tangible ("guanxi") and intangible (comfort letters) form – this support has declined as well, owing to three principal reasons: (1) Rapidly changing policies relating to the sector, e.g., restructuring of the sector and plans to introduce power pooling; (2) Changes in the macro-economic and financial environment which greatly reduced the need for foreign financing of power projects; and (3) The rise of huge local genco conglomerates, such as Huaneng, Beijing Datang and Huadian, and more recently, China Resources Power and China Power International..

In addition to the mismatch in expectations, foreign IPPs suffered more severely than local gencos because they were less "competitive" in terms of tariff levels as they typically require higher returns and incur higher costs. This is exacerbated by the fact that local protectionist instincts of the offtaker occasionally result in biases relating to dispatch, payment and other issues affecting the operations of foreign-invested plants.

1. *Informational Barriers*.

The mismatch in expectations can be partly attributed to the transplant of foreign models of doing business in the power industry – a problem made worse by informational barriers in China. A facet of the Chinese governance system is its lack of transparency and the poor quality of data, especially in official quarters. This lack of transparency is so well-documented that it was difficult to fathom that foreign investors could have made

huge capital investments based solely on economic and industry information available.[46] Nonetheless, many investors usually considered 5-Year Plan figures (provided by the central government), which formed the basis for calculations of the power demand-supply situation, and other critical forecasts, to have some degree of accuracy. There is some basis for this reliance—these figures generally incorporate what relevant bureaucrats and investors consider to be economically and politically realistic assumptions. Moreover, they represent a public commitment on the part of the relevant decision-making bureaucracies.

However, the main problem is that although five-and ten-year plans are adhered to in general, departures from their terms occur with some regularity. Additionally, figures are typically the outcome of multiple rounds of bureaucratic and political compromises, rather than independent assessment. They incorporate assumptions made for political reasons, usually biased toward higher economic growth figures, faster modernization, and better conditions in general than is likely to be realistic. These information barriers are aggravated with respect to information from local governments, which were the sole sources for most of the data and information necessary for foreign IPPs in the project appraisal process.

The poor quality of this information is partly a consequence of national security considerations and local protectionism. In some cases, certain information on capacity expansion plans or constraints of the existing transmission system could be classified as sensitive. On the other hand, data was often produced in the shadow of potential conflicts of interest where the foreign investors had more to gain from forecasting a supply-demand deficit, while the local government may find a situation approaching a surplus more politically secure. Local governments may be tempted to project a higher demand/usage since shortages during peak periods are perceived more as a political embarrassment than an opportunity cost.[47]

2. *Weak Rule of Law and the Enforceability of Contracts*.

When entering China's power industry, many foreign investors assumed that the legal system would shift towards rule of law as China pursued market and legal reforms. Again, there is some basis for this assumption. In 1978, China lacked the basic laws that define a market: there was no contract law, no company law, no intellectual property laws, no securities laws, no banking laws – or at least none appropriate for a market economy.[48] To the extent that laws relating to commerce and foreign investment have been promulgated, the current legal system has improved rapidly. However, mere rules in the books are insufficient, and most observers of China's legal system doubt whether there has been any fundamental shift in the system towards the rule of law. We highlight two major issues in this area affecting foreign investors' in the power industry.

[46] See, for example, Andrews-Speed, Philip, *China's Energy Policy in Transition: Pressures and Constraints,* JOURNAL OF ENERGY LITERATURE, Dec 2001.
[47] Schell, *Charles, Build Operate & Transfer*, at 18 in SCHELL, *supra*, note 18.
[48] *Id.*

First, the Chinese concept of law and contracts has been very different from the Western system. A notable example is that Chinese courts still place substantial emphasis on the "fairness" of the consideration in question, rather than on upholding a commercial bargain reduced to a written contract.[49] If a utility in most developed countries negotiates a power purchase contract where the tariffs are more than 10 times the market price, the courts would insist that the utility fulfills its obligations (barring any vitiating factors such as undue influence), no matter how unfair the bargain. The expectation that this would be true in China as well proved to be a major miscalculation for developers. In China, the value of the consideration may be of fundamental importance—if insufficient, the court may rule that the price is "unfair" and that the parties renegotiate a fair price, thereby discharging the offtaker of onerous commercial obligations.[50]

Second, and more fundamentally, it is a Herculean task to change entrenched attitudes about the subordination of the law to communism *dictat*. Randall Peerenboom once remarked: "To the extent that one can speak of rule of law in China at all, rather than merely rule by law, it is a statist version of rule of law in which law is just a better tool to rationalize state power and to control local governments and private actors alike. Law continues to serve as a handmaiden to Party policy and to serve the interests of the state rather than to protect individual rights and interests".[51] Stanley Lubman described the state of the judiciary as follows:[52] "[There is a] weak differentiation of the courts from the rest of the Chinese bureaucracy, organizational methods in the courts, and a cast of minds among judges that distinguish the courts little from the rest of the bureaucracy…Structural weakness, ideology, rigidity, entrenched interests, localism, and corruption limit the functions and autonomy of courts and undermine their legitimacy."

Therefore, to the dismay of many foreign investors who need to enforce PPAs against provincial power corporations, it was often found that the ability of the legal system to exert control over the actions of governmental actors (and probably their affiliates) has remained limited. [53] Not only was it extremely difficult for a private entity to enforce claims, bring an action, or enforce a judgment against a government body, it was also difficult to hold government officials accountable for illegal practices.[54]

Attempting foreign arbitration is also problematic due to the reluctance of some Chinese entities to agree to it in the PPA in the first place, and the potential difficulties with enforcing a foreign arbitral award in China. As such, the remaining option is typically to provide for recourse through the China International Economic and Trade

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[49] LARRY H.P. LANG, PROJECT FINANCE IN ASIA (1997) at 54. See also THOMAS PYLE (ed.), THE LIFE AND DEATH OF AN INFRASTRUCTURE PROJECT (1997) at 143, which speaks of the Chinese perception that contracts can be constantly renegotiated and modified.
[50] *Id*.
[51] Randall Peerenboom, *Globalization, Path Dependency and the Limits of Law: Administrative Law Reform and Rule of Law in the People's Republic of China*, 19 BERKELEY J. INT'L L. 161 (2001) at 3.
[52] LUBMAN, STANLEY, *BIRD IN A CAGE: LEGAL REFORMS IN CHINA AFTER MAO* (1999), at 317-8.
[53] William P. Alford, *The More Laws, The More...? The Challenge of Building Legality in the People's Republic of China* (1999) (Paper prepared for the Center for Research on Economic Development and Policy Reform of Stanford University's Conference on Chinese Reform) at 5.
[54] *Id.*

Arbitration Centre (CIETAC) arbitration. Pursuing CIETAC arbitration has not been perceived as a clear path to a fair settlement of dispute, mainly because of concerns that the CIETAC tribunals could be politicized and biased towards Chinese entities (which are usually affiliated with the provincial government). While such issues may be dismissed by proponents of CIETAC, the structure of CIETAC rules itself do contain loopholes that potentially perpetuate such concerns.

3. *Reduced governmental support for foreign investment in power*.

As the fiscal situation in China began a drastic turn towards liquidity beginning in 1997, government support for foreign investment in the power sector dwindled in equal parts.[55] In the infrastructure sector, under the newly-adopted "measured easy credit policy",[56] financing for new infrastructure investments by local investors was encouraged by the liquidity in China's financial system. China enjoyed a swelling trade surplus, which was $75 billion for 1999–2001,[57] and one of the highest savings rates in the world (the equivalent of $645 billion in local-currency savings accounts in 1999).[58] Moreover, under pressure to reduce the proportion of non-performing loans (which total an estimated $700 billion), Chinese banks embarked on aggressive lending policies to private firms which tend to be more creditworthy than SOEs. As a result, loans made by Chinese financial institutions increased by RMB 3 trillion ($362.8 billion) from 1998 to 2000.[59]

This accounts for approximately 30 percent of the total balance of loans, i.e., equivalent to one-third of the value of total loans since 1949. Furthermore, to ensure real GDP growth of at least 8 percent in light of deflationary pressures, China invested about RMB 100 billion in public facility and infrastructure in 1998, and in 1999, another 100 billion were expended. In fact, it has been reported that China's real GDP growth reached 7.8 percent in 1998, particularly because of Zhu Rongji's timely decision to issue an additional RMB 100 billion in treasury bonds to pump the economy.[60] In fact, the strong

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[55] Between 1998 and 1999, interest rates on deposits and loans were cut six times, and in 2002, interest rates were at their lowest levels in two decades. Xu Binglan, *Strategy to ease deflationary pressure*, CHINA DAILY, Jun 1, 2002. However, strong deflationary pressures countered these efforts (rates being -0.8 percent in 1998 and -1.4 percent in 1999). Although nominal interest rates were low (around 5 percent to 6 percent in the summer of 1999), the real rate was still as high as about 10 percent. James K. Galbraith and Jiaqing Lu, *Sustainable Development and the Open Door Policy in China*, (2000) (Council on Foreign Relations Paper), *available at* www.ciaonet.org/wps/gaj01/gaj01.pdf (Accessed April 2, 2003). China then used both traditional and new monetary instruments to facilitate its monetary expansion. The package included removing the ceiling on commercial bank loans, encouraging commercial banks to increase loans to fixed-assets investment and to expand into consumption credits, and resuming the central bank's open market. *Supra* note 43.

[56] Wu, Sofia, *'Measured' Easy Credit Policy will Stay Put: CBC Governor*, CENTRAL NEWS AGENCY – TAIWAN, Jan 29, 2001.

[57] Guonan Ma and Robert N McCauley, *Rising foreign currency liquidity of banks in China, available at* http://www.bis.org/publ/qtrpdf/r_qt0209h.pdf (Accessed April 2, 2003).

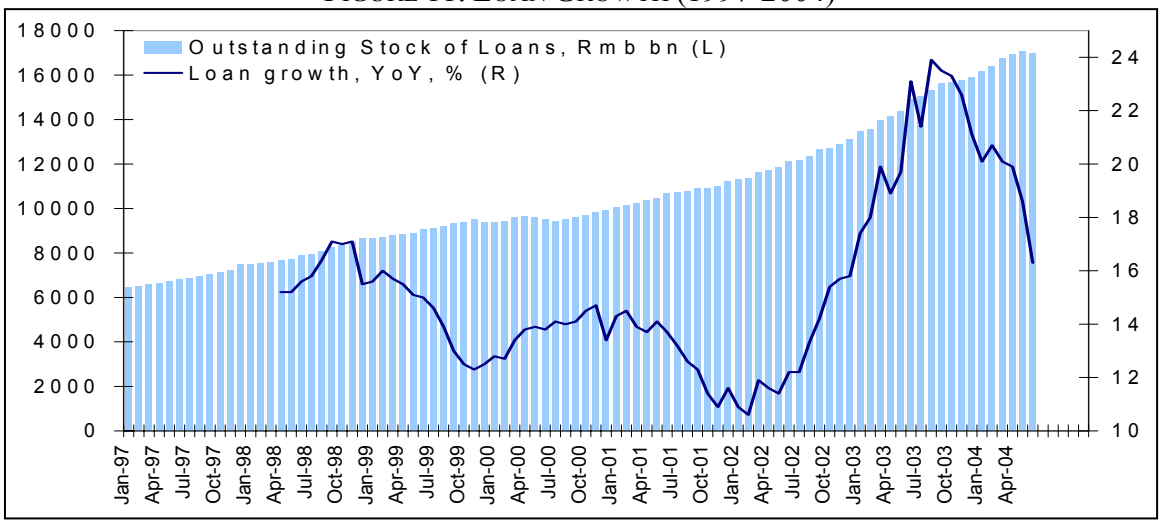
[58] Craig S. Smith and Karby Leggett, *China's Companies Discover Economy Has Ample Liquidity*, WALL ST. J., Feb 4, 1999.

[59] *Monetary Policy Key to China Growth*, CHINAONLINE, Mar 10, 2000.

[60] Lu Ning, *Hits and misses on Zhu's report card*, BUSINESS TIMES (Singapore), Dec 31, 1998.

liquidity situation continues, with new loan creation amounting to US$330 billion (a 43.5% YoY growth).

FIGURE 11: LOAN GROWTH (1997-2004)



Source: Morgan Stanley Research.

In addition to the availability of debt financing, local gencos made inroads into equity financing, which was previously closed to them. The global investment sentiment towards China's growth story has helped local gencos access international capital markets for fund-raising. Currently, there are 3 gencos (Huaneng Power International, Datang Power International and Huadian Power International) which have raised money on the Hong Kong H Share market. Huaneng Power International has also managed to raise money through an issuance of ADRs on the NYSE. According to CLP (one of the surviving foreign IPPs in China), the ability of local gencos to finance projects on their own has limited opportunities for future China ventures for foreign IPPs. For example, joint venture discussions between CLP and a local genco, China Power International, has been stalled owing to the latter's decision to seek its own H Share listing in the near future.[61]

With the availability of capital to local gencos, attracting and sustaining foreign financing appears to be of a lower priority to the Chinese government, especially since they are typically accompanied by expensive and onerous PPAs. This situation may change, given the declining liquidity of China's A Share market and the fact that the easy availability of credit was driven by lack of risk management in the banking sector and hidden subsidies (essentially part of the bad debt problem). Nonetheless, until the tight liquidity problem returns, it seems like governmental support for foreign IPPs may continue its decline.

[61] China Power International listed on the Hong Kong stock exchange in October 2004, after being touted as the "hottest IPO" in the Greater China region for the year. *See, e.g., China Power makes sharp IPO trading debut*, CHINA DAILY, October 16, 2004.

Another major reason for the reduced governmental support is the drastic changes to government policy in the sector. In this highly regulated industry, government policies have swung like a pendulum – from the 1985 policy of opening up the power generation sector and promoting BOT projects with PPAs to more recent reforms aiming to restructure the sector into a competitive wholesale market with power pooling. The unpredictable shifts in policy seem to echo Deng Xiaoping's characterization of China's transition to a market economy in general as "crossing the river while groping for stones."[62] So far, drastic policy changes and reforms in the power sector appear to demonstrate that they were in fact piecemeal changes in response to short-run business fluctuations (or even experimental moves), and not part of a coherent long-term strategic change. In fact, some argue that speaking of China as being in a state of "transition" is not a useful way to characterize the flux in the country, because transition is a path from one state to another future (well-defined) state. From the present policies, it is hard to discern a well-designed blueprint for change or the future state that would be its objective.

Looking back, the 1985 policy might have been implemented to address the acute short-term power shortage, with minimal consideration of how its implementation could impact the long-term prospects in the industry. Additionally, this policy could have been made without proper understanding on the part of the government as to its own avoided costs in allowing foreign development of power projects.[63] Most significantly, a vital issue was "swept under the carpet" at that time – a troubling pattern of irrational tariff setting. To attract investment from foreign sources, the Chinese government, both central and local, used to be enthusiastic about signing PPAs that required high tariffs, leading to a wide tariff differential between foreign and local gencos. This price distortion came back to haunt the industry when the shortage turned to surplus, leading to inefficiencies in production and fierce fights over dispatch among power plants. Such problems not only affected foreign investors facing renegotiations of their contracts but also other local producers (not affiliated with provincial dispatchers).

Eventually, these problems set the impetus towards a drastic shift in policy – power sector restructuring reforms in 1998. See table below for a quick summary of the various changes in the industry regulatory framework since 1985.

[62] Linge, G., and Forbes, D., *The Space Economy of China* in LINGE AND FORBES (eds) *CHINA'S SPATIAL ECONOMY* (1990), at 10.

[63] A study suggested that no country in Asia has demonstrated the ability to come up with a reliable avoided cost estimate in analyzing deals or comparing bids.

TABLE 5: CHANGES IN THE REGULATORY FRAMEWORK

Period	1994 -1997	1998 -2001	2002 -200X	200X -
Return Framework	Cost + Guaranteed Return PPAs	Transition towards new pricing policy Tariff unchanged	New Pricing policy set on social average cost (capacity tariff + energy tariff)	Competitive wholesale generation
Equity Return	~15%	10 -15%	Unspecified average investment cost +equity return above long-term debt cost	Market driven based on supply and demand and new entrant hurdle rate
Tariff	Plant specific	Plant specific	Benchmark tariffs based on average social costs of advance technology plants within a common grid of comparable size, fuel type and age	Universal tariff determined by supply and demand with grid

The post-1985 reforms also envisaged drastic changes to the role of PPAs and the tariffs regime. First, while the Chinese government was once amenable to PPAs and guaranteed returns, the role of PPAs in the industry is practically at an end. Recently, the State Electricity Regulatory Commission ("SERC") published a model PPA which is renewable annually – a far cry from the kind of documentation which foreign IPPs and their attorneys used to negotiate.[64] Furthermore, it is extremely unclear how PPAs can be reconciled with the newly-introduced competitive power pooling systems. The SERC has been vague on this issue by obliging parties to use "best endeavors" to resolve any issue without details as to how this should be done. In light of such uncertainty, it seems as if the government is moving towards a policy requiring gencos to assume merchant risk.

Second, the tariff regime is constantly in flux. As discussed earlier, continuing reform has set tariffs at a uniform level for similar plants based on 20-year operating period with no frontloaded debt allowance. The situation has been further complicated by the NDRC's draft introducing a two-part tariff regime. Under this new system, tariffs are categorized as follows: (1) Capacity payments – which cover fixed costs and are awarded to gencos, regardless of the levels of dispatch; and (2) Energy payments – which cover variable costs and are awarded according to the levels of output sales. This approach is basically introduced in preparation of the proposed power pooling, such that the recovery of capital costs to gencos can be "guaranteed" through capacity payments.

Finally, declining governmental support for foreign IPPs may be attributed to the underlying development in Chinese economic governance. With growing independence in the management of local business, managers have a greater interest in the profitability of the enterprise, leading to an increasing shift in the profit-orientation of these local entities. The rise of local IPPs, in terms of their economic clout and profitability, such as Huaneng Power International, Datang Power International and Huadian Power International attest to the increasingly rivalry. There are also reports that many enterprises (mostly affiliated with local governments), not just those designated as gencos, are now participating in supplying power to the market.[65]With the existence of these

[64] See Model PPA version 1, released by China's State Electricity Regulatory Commission, April 2004.
[65] Interview with China Guodian Group, July 2004.

entities, there may be little that foreign IPPs can do to add value in China's power industry.

4. *Local protectionism*.

Local protectionism was a factor affecting the outcomes of both IPPs and local gencos, usually via provincial government control over dispatch levels and tariffs. A notorious example is the loss-making Ertan power plant, a non-SPC facility financed with the aid of the World Bank. In the last 3 years, it has been running at a low utilization rate of 50%, though it can generate electricity at a substantially lower price (about RMB 0.18 per kWh) compared to other local plants.[66] Despite its lower costs and lack of carbon emissions, the Sichuan and Chongqing government have been unwilling to purchase too much power from Ertan, preferring to dispatch their own provincial coal-fired plants. The challenges presented by this underground market of local politics and bureaucratic competition are enormous for foreign IPPs.

This problem stems from power sector reforms leading to decentralization of authority. The original 1985 opening of the electricity sector removed the exclusive monopoly of the central government over investment in the power industry. This not only allowed foreign investment to come in, but also gave local governments a greater role in the sector. Provincial governments were made responsible for investment decisions on developing local power supplies to supplement the central plan and accommodate local special economic needs. In addition, state-owned power companies were reorganized into provincial subsidiaries (with SPC's assets transferred to them) which were more closely tied to the provinces.

Furthermore, in conjunction with a simultaneous decentralization and reform of the state financial system, provincial authorities obtained greater autonomy in the allocation of credit (bank loans from provincial bank branches). This was coupled with the accumulation of locally controlled funds earned in manufacturing independent of central SOEs, and with the enactment of special surcharges on end-user tariffs that are dedicated to new investment in the provincial utility. In this background, the process of capacity expansion became increasingly less dependent on grants of new capital made directly under the plans of the national electricity administration.[67]

C. Cases Selected for In-Depth Analysis.

We have selected four projects for in-depth analysis – Table 6, below, presents the basic project data for these cases. Selection is based first on the independent variables discussed in the protocol paper. Additionally, in the Chinese case, two variables – the province in which the plant is located and the ownership structure - primarily drive the selection.

[66] *Shocking Times in PRC Power*, BUSINESS CHINA, Sep 24th, 2002.
[67] *Id*.

TABLE 6: CHINESE IPPS SELECTED FOR IN-DEPTH ANALYSIS

Project Name	Major Investors	Finance Closing	MW	Fuel	Location	COD
Shandong Zhonghua	Shandong Electric Power Corp., Shandong International Trust & Investment Corp., China Light & Power, EdF	Apr-98	3000	Coal	Shandong	Aug-97, Aug-98, Sep-03
Meizhouwan	InterGen, Lippo China Resources Ltd, El Paso International Energy Co., ADB	May-98	724	Coal	Fujian	May-02
Shajiao C	Mirant, Yudean (vehicle of Guangdong provincial gov't), Nam Tung, BOCGI	Jun-92	1980	Coal	Guangdong	Jun-96
Jingyuan II	Meiya Power Co., Gansu Electric Power Corp., Gansu Electric Power Construction, Invest. and Dev. Corp.	1995-6	600	Coal	Gansu	1996, 1997

First, it is our preliminary belief that ownership structure, in the sense of the proportion of local-foreign investments, can provide clues as to the politics and governmental policies affecting the project. We have thus picked projects falling along different points of the spectrum for ownership structure, with the wholly foreign-owned Meizhouwan project, the Shajiao C project with roughly 50-50 local and foreign funding, and the Shandong Zhonghua and Jingyuan projects where foreign participation exists as a minority equity stake. Jingyuan is more interesting in that the foreign investor is more than a minority shareholder of the project company, being also a lender in extending a shareholder's loan to the project.

Second, the projects selected are located in different provinces for the purposes of exploring factors such as the following:

- **Supply-demand situation** – the selection covers two projects located in fastest-growing provinces at the southern coast (Meizhouwan and Shajiao C), a project in the less-developed western province (Jingyuan) with slower growing power demand, and a project in Shandong (Shandong Zhonghua) where Shandong has a negatively correlated supply-demand pattern to the rest of the provinces in China.

- **Implementation of government policies** – While general power sector policy is set at the central governmental level, the provincial governmental bodies wield substantial influence in the way these policies are being implemented for individual projects. A comparison of the interaction between these provincial bodies and the projects would provide interesting insights as to the political economy involved.

- **Interaction with local competition** – The major local gencos (Huaneng, Datang, Huadian, etc) have different geographic foci. For example, Huaneng is focused on the coastal areas and Huadian projects are historically concentrated in the Shandong province. The different corporate strategies of these local gencos affect the landscape of local competition faced by foreign investors in IPPs.

Furthermore, in the selection process, we have attempted to maintain important controlling factors:

- **Size** - These projects are mainly large-scale ones, in particular, Shajiao C and Shandong Zhonghua being representative of the mega-scale projects which are attractive to foreign IPPs in the 1990s. We focus on large-scale projects, since this is the mainstay of foreign investment in China's power sector during the 1990s. Moreover, it is more difficult to examine small projects, owing to the scarcity of data.

- **Fuel** - Only coal-fired plants are selected, since these are the mainstay of foreign IPPs' investment in the industry. Foreign-invested plants that rely on gas or oil, or hydroelectric plants are extremely rare.

- **Timing** - The development cycle of these projects started in the early 1990s, though they reached financial close at different times.

China: Universe of Greenfield IPPs

Project Name	Project Company	Major Investors	MW	Fuel	US$ M	Location	Finance closing	COD	PPA
Fujian Houshi	Houshi Power Co. Ltd	Formosa Plastics Group	3600	Coal	3200	Fujian	Oct-98	Apr-00	20
Guangdong Huaji	Huaji Hydro	CLP, China Energy Investment Company, Sun Hung Kai China Development Fund Ltd, Huaji County	115	Hydro	115.7	Guangdong	Jan-99	Jan-03	None
Guangdong Zhuhai	Guangdong Zhuhai Power Station Co.	Cheung Kong Infrastructure Holdings, Guangdong Electric Power Holding Company, The Electric Development (Group) Co of Zhuhai SEZ	1400	Coal	1216.3	Guangdong	Sep-96	Sep-00	20
Hainan Yangpu	Yangpu Power (Hainan) Co. Ltd.	Kumagai Gumi Co. Ltd, Siemens AG, Maeda Corp., Ringo Trading Ltd, Hong Kong Construction (Holdings)	312	Diesel	282	Hainan	Mar-93	1995	15
Hanfeng	Hebei Electric Power Co.	Siemens AG, Hebei Electric Power Co., China Huaneng Group	1320	Coal	1065	Hebei	Jun-97	Jul-01	N.A.
Hefei II	Anhui Hefei United Power Gen Co.	Singapore Power, United Engineers (Singapore) Ltd, various Chinese local govts	600	Coal	560	Anhui	Jun-97	Jun-01	N.A.
Hefei Prosperity Lake Power	Anhui Liyuan-AES Power Co. Ltd.	AES Corporation	116	Oil	64	Anhui	Oct-96	Nov-00	15
Henan Qinyang	Henan Qinyang Power Co. Ltd	Cheung Kong Infrastructure Holdings	110	Coal	HK457	Henan	Jun-98		N.A.
Hubei Puqi	Puqi Sithe Ltd	Sithe China, Marubeni	600	Coal	454	Hubei	May-99	N.A.	20
Jiaozuo Wanfang	Jiaozuo Wanfang Power Co. Ltd	AES Corporation, Jiaozuo Aluminium Mill	250	Coal	106	Henan	Jun-96	Jul-00	20
Jingyuan II	Jingyuan II Power Co. Ltd	Asia Infrastructure Fund, Hydro-Quebec Int'l, PSEG Global Inc, Gansu local government	600	Coal	337	Gansu	Dec-96	Dec-00	
Laibin B		EDF, GE Alsthom	720	Coal	600	Guangxi	Sep-97	Sep-01	18

Luannan	Panda Global Energy Company	Panda Energy International Inc	100	Coal	120	Beijing	Apr-97	Apr-01	
Meizhouwan	Fujian Pacific Power Co. Ltd	InterGen, Lippo China Resources Ltd, El Paso International Energy Company, ADB	724	Coal	755	Fujian	May-98	May-02	20
Nanhai Jiangnan	Nanhai Jiangnan Power Co. Ltd	Cheung Kong Infrastructure Holdings, local govt	121	Coal	30	Jiangnan	May-95	May-99	5?
Nanhai Power Plant	Nanhai Power Plant I Co. Ltd	Cheung Kong Infrastructure Holdings, local govt	400	Oil	228	Jiangnan	Apr-95	Apr-99	15
Nanyang	Nanyang General Light Electric Co. Ltd	AEP Resources, Henan Electric Power	250	Coal	172	Henan	Apr-97	May-01	
Qinglan	Qinglan Electric Power Co. Ltd	Enron Corp., Singapore Power	154	Gas	150	Hainan	Sep-94	Oct-98	
Shajiao B	Shenzhen Guang-Shen Shajiao B Electric Co. Ltd.	Shenzhen Energy Group, Guangdong Electric Power Group, China Resources Power Holding Company	1960	Coal	526	Guangdong	Dec-86	Apr-88	10
Shajiao C	Resources Shajiao C Investments Ltd.	Mirant, Yudean (vehicle of the Guangdong provincial government), Nam Tung, BOCGI	1980	Coal	1870	Guangdong	Jun-92	Jun-96	15
Shandong Rizhao	Shandong Rizhao Power Co. Ltd	China Investment Power Corp., Shandong Huaneng Power Dev't Co., Shandong Int'l Trust & Investment Corp., Rizhao Econ. Dev't General Co., Shandong Provincial Electric Power Co., UDI Hong Kong,Siemens Power Dev't	700	Coal	650	Shandong	Apr-92	Apr-00	17.5
Shandong Zhonghua	Shandong Zhonghua Power Development Co. Ltd	Shandong Electric Power Corporation, Shandong International Trust & Investment Corporation, China Light & Power, EdF	3000	Coal	2187	Shandong	Apr-98	Aug-97, Aug-98, Sep-03	20
Shantou Tuopu	Shantou Changpu Power Development Co. Ltd.	Cheung Kong Infrastructure Holdings	114	Coal	63	Guangdong	Dec-93		15
Sichuan Anning River	Sichuan Anning River Energy Development Co. Ltd	Asia Power	117	Hydro	1.8	Sichuan	May-02	N.A.	N.A.

Sichuan Maoergai Hydropower	Sichuan Maoergai Hydropower Development Co. Ltd	Asia Power	556	Hydro	4.9	Sichuan	Jul-02	N.A.	N.A.
Tangshan Sithe	Tangshan Sithe Thermal Power Co.	AIG, Sithe Energies Inc, Tangshan Development Investment Company,	200	Coal	174	Hebei	Sep-96	N.A.	
Wenzhou Telluride II	Zhejiang Wenzhou Power Co.	Sithe China, Oxbow, Zhejiang Electric Power Development, Wenzhou Electric Power Investment	600	Coal	415	Zhejiang	May-98	Jun-01	20
Wuhu Shaoda	Wuhu Zhaoda Electric Power Development Co.	AES Corporation, Anhui Liyuan Electric Power Development Company, Wuhu Energy Development Company	250	Coal	115	Anhui	Apr-94	Apr-00	15
Yangcheng	Yangcheng Int'l Power Co	AES Corporation, North China Electric Power, local utilities in Shanxi and Jiangsu, and provincial investment arms	2100	Coal	1600	Shanxi	Jun-97	Jul-01	20
Zhabei	Zhabei Power Co. Ltd	GE Capital, Shanghai Municipal Electric Power Corp	400	Oil	250	Shanghai	Dec-96	Dec-00	
Zhujiang	Guangzhou Pearl River Power Co. Ltd	New World Infrastructure Ltd, Guangzhou Development Industry (Holdings) Co. Ltd	600	Coal	416.5	Guangdong	Jan-93	Jan-00	20
Zunhua Keppel	Zunhua Xinli Energy Development Co. Ltd	Keppel Group, Hebei Electric Power Co.	100	Coal	70	Hebei	Jun-97	Jul-01	

Electricity Generation in a Sample of Chinese Owned Power Plants

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Potential maximum output (mMWH)									
Shantou Coal, Guangdong (Ph I, Unit 1-2)	-	-	5.26	5.26	5.26	5.27	5.26	5.26	5.26
Dalian, Liaoning (Ph I, Unit 1-2)	6.13	6.15	6.13	6.13	6.13	6.15	6.13	6.13	6.13
Fuzhou, Fujian (Ph I, Unit 1-2)	6.13	6.15	6.13	6.13	6.13	6.15	6.13	6.13	6.13
Shangan, Hebei (Ph I, Unit 1-2)	6.13	6.15	6.13	6.13	6.13	6.15	6.13	6.13	6.13
Shangan, Hebei (Ph II, Unit 1-2)	0.00	0.00	5.26	5.26	5.26	5.27	5.26	5.26	5.26
Nantong, Jiangsu (Ph I, Unit 1-2)	6.13	6.15	6.13	6.13	6.13	6.15	6.13	6.13	6.17
Shidongkou II, Shanghai (Ph I, Unit 1)	-	-	10.51	10.51	10.51	10.54	10.51	10.51	10.51
Dezhou (Ph I-II, Unit 1-4)	10.51	10.54	10.51	10.51	10.51	10.54	10.51	10.51	10.51
Jining (Subsidiary), Shandong	2.63	2.64	2.63	2.63	2.63	2.64	2.63	2.63	3.59
Weihai (Subsidiary), Shandong	2.19	2.20	2.19	7.45	7.45	7.47	7.45	7.45	7.45
Gross generation (mMWH)									
Shantou Coal, Guangdong (Ph I, Unit 1-2)	-	-	2.04	2.79	3.17	3.92	3.84	4.18	4.45
Dalian, Liaoning (Ph I, Unit 1-2)	3.92	4.29	4.05	3.85	3.24	3.29	3.16	3.53	4.24
Fuzhou, Fujian (Ph I, Unit 1-2)	4.17	4.64	3.80	3.71	3.81	3.51	2.84	3.60	4.43
Shangan, Hebei (Ph I, Unit 1-2)	3.61	3.82	3.93	3.66	3.78	4.09	3.95	4.11	4.01
Shangan, Hebei (Ph II, Unit 1-2)	-	-	0.35	2.61	3.33	3.32	3.45	3.52	4.01
Nantong, Jiangsu (Ph I, Unit 1-2)	4.50	3.82	3.87	3.62	3.05	3.40	3.56	3.90	4.20
Shidongkou II, Shanghai (Ph I, Unit 1)	-	-	3.52	6.81	6.78	7.38	7.36	7.54	8.29
Dezhou (Ph I-II, Unit 1-4)	6.86	7.49	7.33	6.24	6.46	6.72	6.83	6.89	5.97
Jining (Subsidiary), Shandong	1.53	1.49	1.26	1.08	1.23	1.35	1.93	1.97	2.21
Weihai (Subsidiary), Shandong	0.98	1.02	0.92	1.45	2.28	2.48	4.35	4.49	4.36

Source: Company data

Capacity Factor in Selected Chinese-Owned Power Plants

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Capacity factor									
Shantou Coal, Guangdong (Ph I, Unit 1-2)	-	-	38.8%	53.2%	60.3%	74.4%	73.1%	79.5%	84.7%
Dalian, Liaoning (Ph I, Unit 1-2)	64.0%	69.7%	66.0%	62.8%	52.9%	53.6%	51.5%	57.5%	69.1%
Fuzhou, Fujian (Ph I, Unit 1-2)	67.9%	75.5%	62.0%	60.5%	62.2%	57.1%	46.3%	58.7%	72.2%
Shangan, Hebei (Ph I, Unit 1-2)	58.9%	62.1%	64.1%	59.7%	61.7%	66.5%	64.5%	67.0%	65.4%
Shangan, Hebei (Ph II, Unit 1-2)	-	-	6.7%	49.7%	63.3%	63.0%	65.6%	67.0%	76.3%
Nantong, Jiangsu (Ph I, Unit 1-2)	73.4%	62.1%	63.2%	59.0%	49.7%	55.2%	58.0%	63.6%	68.0%
Shidongkou II, Shanghai (A) (Ph I, Unit 1)	-	-	33.4%	64.8%	64.5%	70.0%	70.0%	71.7%	78.9%
Dezhou (Ph I-II, Unit 1-4)	65.3%	71.1%	69.7%	59.4%	61.4%	63.8%	65.0%	65.5%	56.7%
Jining (Subsidiary), Shandong	58.3%	56.7%	47.8%	41.0%	47.0%	68.1%	73.5%	75.1%	61.6%
Weihai (Subsidiary), Shandong	44.9%	46.3%	42.0%	19.4%	30.6%	55.4%	58.5%	60.3%	58.6%
Annual utilization hours									
Shantou Coal, Guangdong (Ph I, Unit 1-2)	-	-	3,402	4,656	5,283	6,534	6,402	6,967	7,417
Dalian, Liaoning (Ph I, Unit 1-2)	5,603	6,126	5,783	5,497	4,631	4,706	4,507	5,039	6,050
Fuzhou, Fujian (Ph I, Unit 1-2)	5,952	6,630	5,435	5,300	5,447	5,017	4,058	5,144	6,329
Shangan, Hebei (Ph I, Unit 1-2)	5,158	5,457	5,613	5,230	5,406	5,842	5,647	5,867	5,729
Shangan, Hebei (Ph II, Unit 1-2)	-	-	583	4,353	5,543	5,534	5,746	5,867	6,683
Nantong, Jiangsu (Ph I, Unit 1-2)	6,430	5,451	5,532	5,172	4,353	4,852	5,079	5,572	5,959
Shidongkou II, Shanghai (A) (Ph I, Unit 1)	-	-	2,930	5,679	5,651	6,148	6,131	6,281	6,908
Dezhou (Ph I-II, Unit 1-4)	5,719	6,242	6,109	5,202	5,379	5,601	5,691	5,741	4,971
Jining (Subsidiary), Shandong	5,108	4,979	4,187	3,592	4,115	5,985	6,439	6,577	3,714
Weihai (Subsidiary), Shandong	3,936	4,067	3,681	1,703	2,678	4,868	5,121	5,281	5,129

Source: Company data

Fujian Meizhouwan[68]
China

Specifications			
Capacity	724MW	**MOU**	1992
Fuel	Coal	**PPA**	1995
Approved Cost	$655.3 million	**Financing**	1998
Actual Cost	$755.2 million	**COD**	*2001
Debt: Equity	75:52	**PPA Term**	20 years
		Ownership	BOT
Sponsors			Intergen (45%), Lippo China Resources (25%) El Paso Corp. (24.8%), ADB (5.2%)
EPC Contractor			Bechtel Power Corp.
Operator			Intergen
Multilateral involvement			ADB, COFACE, CESCE
Offtaker			Fujian Provincial Electric Power Bureau
Lenders			*See details below*

* *See details of dispute regarding COD below.*

I. OVERVIEW.

The Meizhou Wan project was the first wholly-foreign owned power project outside the State-sponsored build-own-transfer (BOT) program. It was once seen as a huge success and a model for foreign players in the Chinese power market, with its financial close amidst the Asian financial crisis. At that time, William Wild, vice-president of BA Asia remarked, "They see it as a priority project which will give them increased baseload thermal capacity and remove their dependence on hydropower."

The project was initially conceived as part of a development called Tati City (with commercial, industrial and leisure elements) which was being carried out by the Lippo Group. Lippo Group subsequently brought in Intergen and others as partners in the project company, Fujian Pacific. During the Asian Financial Crisis when Lippo's financial profile was affected, Intergen increased its equity stake by acquiring a 30 percent stake from Lippo's subsidiary. The plant came online in March 2001.

[68] The background information and initial drafts of this case study were prepared by Pei Yee Woo; additional research and editing was conducted by Erik Woodhouse. An independent case study was undertaken at Stanford Law School, which provided additional information. *See* Josh Eagle, The Meizhouwan Power Project, Stanford Program in International Law, Business, and Policy, Case No. 001-99. The primary information sources for this project study include selected interviews with officials from Intergen, Bechtel Enterprises, and the law firm Milbank, Tweed, Hadley & McCloy. *See also,* Milbank, Tweed, Hadley & McCloy, *Running the Marathon: The Long March to the Successful Completion of Meizhouwan* in SORAB, BEENA AND BENEDICT ROGERS (eds), PROJECT FINANCE MODELS FOR GREATER CHINA (1999) and various news clippings – see Bibliography.

II. SIGNIFICANT ASPECTS OF PROJECT STRUCTURE.

A. Sponsors.

Meizhouwan was developed by Fujian Pacific Electric Company Limited, a consortium of international project sponsors, including InterGen, El Paso Corp., Edison Mission, and Bechtel Power. InterGen entered by acquiring Bechtel's share when it was created as a joint venture between Bechtel and Shell. Edison Mission exited the project in 1996. The core investor group comprised InterGen, El Paso, and Lippo China Resources, Ltd.

Lippo China Resources was part of the Lippo Group, an Indonesian business conglomerate with substantial holdings throughout Asia. The group's director and founder, Dr. Mochtar Riady, had been born and raised in Fujian Province. Lippo originated the Meizhouwan plan, signing and MOU with Fujian Province in 1992, and bringing the foreign partners on board in 1993.

After divesting its equity stake to its new subsidiary, Bechtel retained a stake in Meizhouwan via the EPC contract, which was held by Bechtel Power Corporation, under a turnkey, fixed price contract worth $498.4 million.

B. Financing.

Project costs amounted to around $755.2 million, or $1,001/kW. Meizhou Wan is said to be the 2nd most expensive power producers in Fujian, according to a power industry executive. Commercial lenders include: BNP Paribas (then Banque Paribas), BA Asia, UFJ Bank (then Tokai Bank), and CSFB. As this project involves a fully-foreign syndicated loan on a international project finance basis, the costs of debt funding is inevitably higher, compared to local projects or joint ventures with RMB funding.[69]

TABLE 1: MEIZHOUWAN CAPITAL STRUCTURE (US$ MILLION)

Source of Funds	Amount	% of total
ADB Direct Loan	40,000	5.3 percent
ADB Co-financing Facility	150,000	19.9 percent
CESCE Insured Facility	75,652	10.0 percent
COFACE Insured Facility	52,724	7.0 percent
Commercial Loan Facility	218,015	28.9 percent
Receivables Facility	30,000	4.0 percent
Shareholder Equity	188,799	25.0 percent
TOTAL	755,190	100.0 percent

[69] Note – this was not true when the project was financed. The PBOC rate was over 10 percent at that point and the project's average finance rate is 8.3 percent. Most of the rates were fixed in 1998 and interest rates have dramatically declined since then.

In contrast to many other projects in China, Meizhouwan allocated foreign exchange risk to its offtaker. The PPA contained terms that indexed payments to US dollars, if variation in the RMB/USD rate exceeded 6%.

C. Fuel Arrangements.

Miezhouwan imported Indonesian low-sulfur coal from PT Kaltim Prima Coal (a joint venture between British Petroleum and Rio Tinto), instead of Chinese coal. Payment for its Indonesian coal supply is tied to the Japanese benchmark coal price and will fluctuate with it. The fiscal 2001 Japanese benchmark steam coal price has been rising in recent years by a significant percentage above the U.S.$ 28.75 per mt fiscal 2000 average benchmark price.

According to Intergen, the choice of coal was made due to the requirement by the SDPC in its early approval not to use Northern China coal for the Miezhou Wan, and was driven by a prevailing shortage of coal in China at the time. Second, construction costs were higher compared to local plants as it used a foreign EPC contractor and a lump sum turnkey contract required for international financing – Bechtel Power and imported foreign equipment. Thirdly, the interest costs are much higher than domestically funded projects due to the nature of international limited recourse financing with ECAs involvement.

D. Power Sales Arrangements.

The term of the PPA extends for 20 years. Under the PPA, the minimum offtake is defined as the Base Annual Quantity equal to the product of 5,000 hours (equivalent to a 57% capacity factor) and the Rated Facility Output. The tariff is structured on a "cost-of-service" basis. It provides, at base annual quantity, the full recovery of all reasonable fixed and variable operating costs, taxes and surcharges, and includes a capital recovery component sufficient to fully service debt and provides an agreed return on equity.

The tariff protocol includes an annual adjustment component which recovers or repays prior year: (1) foreign exchange gains and losses; (2) differences between actual fuel costs and budgeted fuel costs caused by changes to the dispatch profile and/or unit fuel cost; and (3) incremental operating costs incurred due to changes in PRC law or government policy. Prior to commissioning, the plant would by paid a "test energy tariff" that was to be equal to the tariff of the most recently commissioned comparable thermal plant in Fujian—this was anticipated to be the Huaneng Fuzhou Phase I expansion.

E. Government & Multilateral Support.

The Project received SPC approval in September 1993 and SPC reconfirmation of that approval in November 1996. According to the information memorandum, this project has received strong support from the Fujian Provincial Government throughout its development process. Letters of support, incorporating language intended to support the offtaker's creditworthiness, provided by the Fujian Government, the Price Committee, and SPC are also evidence of governmental support for the Project.

However, where other projects that we have examined in China incorporated some sort of risk sharing between local and foreign partners into relevant agreements, Meizhouwan seemed content to rely on less formal arrangements. This appears starkly in the negotiation of a stabilization clause to protect the project from adverse changes in law. In response to the sponsor's demand that the Power Bureau include explicit indemnification language, the local authorities maintained that they were a private company in no better position to manage this risk than InterGen or Lippo. The Power Bureau eventually agreed to this clause, but to have meaning, the agreement would have to reflect an understanding between the bureau and relevant provincial and central government officials. Project attorneys never really knew what this understanding was.[70]

Project stakeholders included ADB (equity and lending facilities), COFACE (providing political and commercial risk cover) and CESCE (providing extended political risk insurance). Note that this was the first power project in which the ADB undertook equity risks in China in addition to limited recourse debt support, underlining its initial confidence in the project.

III. HOST COUNTRY CONTEXT: FUJIAN PROVINCE.

Provincial Electricity Sector Overview[71]			
Capacity	10,415MW	Thermal (49%)	Hydro (51%)
Generation	40 billion kWh	Thermal (52%)	Hydro (48%)
Utilization Rate	44%	Thermal (47%)	Hydro (48%)
Avg. Wholesale Tariff	RMB 399/kWh		
Avg. Retail Tariff	RMB 367/kWh		
GDP per capita	$1,361		

Fujian Province was one of the first provinces designated by the PRC Government to pioneer the implementation of China's economic reform and open policy. In 1980, Xiamen was appointed by the State Council as one of the Special Economic Zones in China. In 1984, Fuzhou was designated by the PRC Government as one of the 14 coastal open cities with authority to offer certain preferential tax and other beneficial treatment to foreign investors. The Fujian Provincial Grid is independent of all other transmission systems in China.

At the time of appraising this project, the power supply and demand projections released by the Fujian government appeared to be extremely optimistic. According to the FPEPB then, the provincial electricity consumption was expected to grow from 28.9 TWh in 1996 to 48 TWh in 2000 and 136 TWh in 2010, i.e., more than 4 times. Such demand projections were approximately 1.1–1.2 times the respective projected annual growth rate in GNP. To meet this demand, it was projected that Fujian needed to increase its installed generating capacity from 7374MW in 1996 to 12,479 MW in 2000 and 19,235 MW in 2005. As a result of such optimistic projections, the Fujian provincial government power bureau was "very aggressive" in seeking foreign investment.

[70] Josh Eagle, The Meizhouwan Power Project, Stanford Program in International Law, Business, and Policy, Case No. 001-99, at 24.
[71] Morgan Stanley Research (2002).

However, at the time of Meizhou Wan's renegotiations, the Fujian province was oversupplied with power. Generation growth in Fujian was estimated to be 10.8 percent in 1999, 11.6 percent in 2000 and 15 percent in 2001, as compared with the national average of 6.4 percent, 10.1 percent and 6.5 percent respectively. First, it appears that Fujian's aggressive strategy in increasing installed capacity had contributed to the over-supply. For example, a 3600 MW coal-fired plant built by Formosa Plastics group, one of the largest investors in the province, came online roughly at the same time as the Meizhouwan plant. Second, the over-supply was a seasonal phenomenon as a significant feature of the Fujian province is its high dependence on hydropower. Hydropower represented 61 percent of the provincial capacity in 1995 and 51 percent in 2001. 2001 was an extremely wet hydrological year, leading to an abundance of cheap hydropower available in the market. At that time, even local IPPs were affected, e.g., Huaneng Power International saw a drop off in plant utilization. This occurred in light of the Fujian government sourcing power from hydroelectric plants. Nonetheless, it is said that the seasonal cheap hydropower has ended its run. In 2002, based on Fujian's supply-demand outlook, CSFB has even projected the opportunity for greenfield projects in Fujian to be "excellent". [72]

IV. PROJECT PERFORMANCE: THE MIEZHOUWAN POWER PROJECT.

Currently, this project has joined a series of cases where provincial entities reneged on the power purchase agreement. After the completion of the testing period in mid 2001 (where power was sold at low testing energy tariffs), Fujian Pacific indicated its intention to declare the occurrence of the "Commercial Operations Date" (COD). According to Intergen, the FPEPB refused to allow such declaration, citing that governmental approvals are required for COD and technical problems of the units. Intergen argued that the requirement for governmental approval which the FPEPB was absent in both the PPA and published regulations. Further, Intergen said that independent and well-known industry engineering firms had certified that the plant could meet COD at that time. At this juncture, Fujian Pacific went ahead to declare COD unilaterally and one of the units was shut down in late September by the FPEPC till early 2002. Subsequently in June 2002, the project company missed its completion deadline under financial agreements and was in default. In September 2002, it was over $20 million short in debt service.

Beginning in late 2001, the public press has reported ongoing renegotiations of the PPA under which the Fujian Provincial Electric Power Company (formerly Fujian Provincial Power Bureau, FPEPC) has initially contracted to buy a minimum of 3.6TWh a year from the plant on a take or pay basis at RMB 0.517 per kWh (51.7 fen/kWh) (which received SDPC approval). Provincial officials reportedly told the Fujian Pacific (the project company) to sell power at a rate close to the grid average tariff rate of around RMB 0.40 per kWh, citing a considerable local oversupply of power and the resulting low prices from other generators (none of which has a minimum offtake PPA). A Fujian Province Power Corporation official remarked publicly, "At the current price, we are making losses by using the electricity from Meizhou Wan." He added that the average price per kWh in Fujian was RMB 0.40.

Renegotiations culminated in an interim restructuring agreement in late 2002. The crux of this restructuring was to re-negotiate a new tariff rate while applying a temporary tariff rate of RMB 0.418 kWh for an interim period, and to lower costs through the use of domestic coal and

[72] Credit Suisse First Boston, *China Power: A New Dawn* (2002)(equity research report), at 8.

refinancing the foreign-denominated debt. The interim payments reportedly covered operating costs and debt service, but included no return on equity.

Chinese coal is now sourced from Northern China, being delivered to northern ports by rail and the transported by sea to Fujian. In the meantime, the power surplus situation in Fujian, which peaked during 2001, has now eased. However, there are concerns by some interviewees that the tariffs specified for the interim period may be further reduced. Even the management of Huaneng Power has cautioned that its plants in Fujian may receive tariff cuts of up to 10 percent in the near future.

Shandong Zhonghua[73]
China

Specifications			
Capacity	3000MW	**MOU**	
Fuel	Coal	**PPA**	
Technology		**Financing**	April 1998
Actual Cost	$2.2 billion	**COD**	2003 & 04 for greenfield units
Leverage	70:30 (Debt: Equity)	**PPA Term**	20 years
Ownership	BOT (Sino-foreign JV)		
Sponsors			Shandong Electric Power Corporation (36.6%), Shandong Int'l Trust & Invest. Corp. (14.4%), China Light & Power[74] (29.45%), EdF International (19.6%)
EPC Contractor			Consortium of the sponsor companies
Operator			SEPC
Multilateral involvement			ECGD
Offtaker			Shandong Electric Power Grid Co
Lenders			SG Asia Ltd, Greenwich Natwest, IBJ Asia, China Construction Bank, and Shandong ITIC

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I. Overview.

This paper provides a case study of the Shandong Zhonghua project. The basic structure of the deal involves a Sino-foreign joint venture project company acquiring an existing power plant and developing two additional units to sell electricity to the Shandong provincial grid. This project has been selected for analysis: (1) as a contrast to the wholly-foreign owned Miezhouwan project, (2) as a contrast to the local-foreign joint venture Shajiao C project because Shandong involves European and Hong Kong utilities rather than an American power producer as the key foreign participants, and (3) because the supply-demand balance in the Shandong provincial grid has varied against those in other parts of China, particularly Fujian and Guangdong.

II. Project History & Structure

The Shandong Zhonghua project reached financial close in May 1998. At that time, it was considered a breakthrough in IPP development in China. Foreign investors would hold four major generating assets at different stages of development, namely two brownfield units and two greenfield units. Shandong Zhonghua's enormous aggregate installed capacity (3000MW on completion) and renminbi loans in the financing package made it even more groundbreaking.

[73] The background research for this project study was prepared by Pei Yee Woo; additional research and interviews were conducted by Erik Woodhouse. The project information is drawn from public industry sources as cited in the footnotes, and was discussed in selected telephone interviews with officials from China Light & Power, Aug. 11, 2005.

[74] CLP holds its equity portion through the China Energy Investment Company.

Since financial close, the Shiheng I and II coal-fired plants (each with 2*300MW) have operated satisfactorily. The construction of the new Heze (2*300MW) and Liaocheng (2*600MW) coal-fired units were commissioned and operational in 2003 and 2004 respectively.

A. Sponsors.

The Shandong Zhonghua Project Company is a joint venture owned 36.6% by the Shandong Electric Power Corp. ("SEPCO"), 14.4% by the Shandong International Trust and Investment Corp., 29.4% by CLP Holdings' China investment arm and 19.6% by Electricite de France. The project was conceived on the basis of a joint venture to take over an existing plant and then construct two new projects. Foreign investors participated for both strategic and financial reasons. Subsequently, as a result of the power sector reform in China, SEPCO's stake in the two new projects was effectively transferred to China Guodian Group, one of the new national generation companies. This transfer has been complex and ambiguous, since it is not contractually possible to divide up the joint venture assets in this way, but the other investors have had to accept the reality of the situation.,

SEPCO and the two foreign sponsors, CLP and EdF, already have a good working relationship through joint work in the Guangdong Daya Bay nuclear power plant developed in the 1980s. Throughout the 1980s and 1990s, EdF has been actively engaged in China's nuclear power business as well as providing engineering services to China's power generation industry. In addition to its equity stake in the Shandong Zhonghua project, EdF is the sole owner of two 360 MW units of the Laibin B project in Guangxi which was commissioned at the end of 2000 (after the former 40% owner, Alstom, sold its stake to EdF). In 2004, EdF also signed a framework agreement with one of the Chinese national generation companies, China Power Investment, to cooperate in areas including power project development, construction and operation management.[75]

CLP is a major repeat player in the Chinese power generation industry with several operational and ongoing projects in China. Its major Chinese projects are listed in the table below:

TABLE 1: CHINA LIGHT & POWER'S MAJOR POWER GENERATION ASSETS IN CHINA

Project	MW	Stake	Description
Guangdong Daya Bay Nuclear	1,968	25%	70% electricity generated is supplied to CLP's HK network.
Guangdong Pumped Storage	1,200	49%	CLP has the right to use half of the electricity generated for its needs until 2034.
CLP Guohua	2,100	49%	This 49-51 joint venture between CLP and Beijing Guohua, has 3 coal-fired plants located in Beijing, Tianjin and Hebei.
Guizhou Anshun II	600	70%	This joint venture between CLP, Huadian and Guizhou Dev't & Invest. Corp, supplies the Guizhou grid and is part of China's West-to-East electricity supply policy.
Shenmu II	200	49%	This is an equity stake bought from TXU Corp, which is managed as part of CLP Guohua.

[75] Platts Power Asia, *CPI signs accord with EDF,* May 27 2004.

Guangdong Huaiji Power	98	42%	This is a project between CLP, the Huaiji county electric power corporation and other minority investors dealing with a portfolio of hydroelectric power stations in the Huaiji county.

CLP's interest in Chinese power investment has cooled in recent years, after its last acquisition of the Guizhou Anshun II project. According to its 2004 Annual Report, it has made "limited progress in sourcing new development projects and creating new partnerships in the Mainland's power sector … reflecting [our] prudent approach to investment in additional generating assets in the Mainland. [We] considered this approach to be the right one to take in the long-term interests of shareholders…"[76] In justifying this approach, CLP cited continuing lack of transparency and predictability in the tariff setting process, uncertainties in the project approval process, potential for sharp swings in the electricity supply-demand balance and competition from domestic power producers which bid for existing/new projects on a basis that does not reflect the risks and the need to earn meaningful returns on investments.[77]

B. Project Costs and Financing.

The total cost of the Shandong Zhonghua project is US$2.2 billion, 70% of which is funded by export credit financing, USD syndicated commercial loans and renminbi loans. The remainder was funded by equity investments by the parties. Generally, costs are kept relatively low due to a large local apex component—local EPC construction contract, equipment and fuel.[78] Nonetheless, the local components of the project also introduced some challenges of their own for financing, which were handled in a variety of ways.

First, the EPC contractor comprises the sponsor group as a consortium, with SEPCO being the lead contractor with the responsibility of undertaking the scope of works. This enabled the EPC contract to be governed by an international law (i.e., English law), yet meeting the requirements of the lead contractor for its obligations to be the subject of a PRC law-governed contract. Also, as domestic EPC contractors were not typically considered "financially viable" in the event of recovery of damages for breach, the use of the EPC consortium provided sufficient credit support for the liquidated damages cover. Second, SEPCO assumed fuel supply risks, i.e., it is responsible for entering into suitable coal supply arrangements and making adequate coal transport arrangements. Coal was sourced locally, from nearby mines in the Shandong and Shanxi province.[79] The proximity of the coal mines to the plants reduced transportation costs (which accounts for nearly 40% of the total delivered fuel costs). Third, the equipment was sourced from Shanghai Electric (a 35 percent Westinghouse joint venture) which was the supplier for the 2 existing plants and confirmed by Houston-based Brown & Root to meet international standards.

The Shandong Zhonghua project has a unique financing structure. There are 2 distinct differences with the financing of the Meizhouwan project: (1) from the outset, there is a substantial RMB loan component (which implied lower currency mismatch risks); and (2) from the outset, there is internal revenue generation due to the presence of existing brownfield assets.

[76] CLP's Annual Report filed with the HKSE (2004).
[77] Id.
[78] Verified with Maria Leong, CLP in 2003.
[79] Information from CLP in Bloomberg database.

TABLE 2: ORIGINAL FINANCING FOR SHANDONG ZHONGHUA

Source of Funds	Amount (US$)	Amount (RMB)	% of total
Shareholder Equity (Chinese)	292,000	2,420,000	13.4 percent
Shareholder Equity (Foreign)	281,000	2,330,000	12.8 percent
Commercial Loan Facility	350,000	2,897,300	16.0 percent
RMB Loan Facility	822,000	6,800,000	37.6 percent
ECGD Facility	312,000	2,582,736	14.3 percent
Internal Revenues	99,000	820,000	4.5 percent
Working Capital	31,000	260,000	1.4 percent
TOTAL	2,187,000	18,110,036	100.0 percent

Initial lenders to the project company include: SG Asia Ltd, Greenwich Natwest, IBJ Asia, China Construction Bank and SITIC. The financing structure, as detailed above, has changed since the financial close. In 2003, the Shandong Zhonghua project company has successfully re-financed all of its foreign currency loans into RMB and USD loans with lower costs and longer tenors to help manage foreign currency risk on the project.[80]

The new loan for the Shandong Zhonghua project company amounts to US$1.29 billion with a 20-year tenor (maturing in 2024). It is divided into a US$560 million tranche, and a RMB 6.6 billion tranche.[81] The detailed lending structure is listed as follows:

TABLE 2: REFINANCING STRUCTURE FOR SHANDONG ZHONGHUA

Financial Institution	Amount
USD Tranche	
China Construction Bank	US$180m
Bank of China	US$160m
ICBC	US$160m
Agricultural Bank of China	US$50m
China Merchants Bank	US$10m
RMB Tranche	
Shandong ITIC	RMB 1,370m
China Construction Bank	RMB 1,500m
Bank of China	RMB 1,320m
ICBC	RMB 1,320m
Agricultural Bank of China	RMB 410m
China Merchants Bank	RMB 150m

The margin interest for the local currency portion is expected to be below the official People's Bank of China rate, possibly with a 10% discount. The margin for the USD portion is around a low of 100 basis points over Libor, and lower than the 175 basis points paid to foreign

[80] Supra, CLP's Annual Report (2004). Interview with Ashley Wilkins of Societe Generale (financial advisor involved) in Sep 2004.
[81] Thomson News, *Shandong Refis Power Loan,* June 23 2004.

lenders of the commercial tranche at the post-construction stage.[82] While the project company will benefit in the long run through lower interest expenses, sponsors had to take refinancing penalties. For example, CLP has suffered a one-off financial charge relating to refinancing costs (i.e., penalties for prepayment of debt and swap contracts) of approximately HK$80 million.[83]

C. Key Project Contracts.

The joint venture company has entered into fixed-price, date-certain turnkey contracts for the design, supply, construction, erection and completion of the Heze and Liaocheng Power stations. The EPC contracts include liquidated damages for delay (20 percent of EPC price) and liquidated damages for under-performance (15 percent of EPC price). The cap on cumulative liquidated damages is 20 percent of the total contract price.

The term of the Operation and Offtake Contract ("OOC") extends for 20 years for each plant. Under the OOC, SEPCO acts as the offtaker, operator and fuel supplier for the four plants. As the offtaker, SEPCO is required to purchase power from the power stations and pay at the approved grid tariff rate. The tariff is composed solely of a single rate for energy payments (no capacity payments), assured revenue is secured with a minimum offtake providing for at least 5,500 hours (or 5,000 in the first year) of power per year. The OOC is denominated in Chinese currency and is not indexed; the foreign sponsors carry the risk of currency devaluation of inconvertibility.

According to the contracts, the tariff is calculated through a formula that adds up various cost components (operations, fuel, debt service, etc.) and shareholders equity returns to produce the tariff.

In reality, the tariffs for the greenfield phases have not been determined in this simple way and are lower than that for the originally existing plant. The tariff for the original units is 41 fen/kWh. When the greenfield units came online in 2003-04, the contract formula would have produced prices up to around 50 fen/kWh at a time when a typical grid price in Shandong was roughly 34 fen/kWh. The contract price was never implemented. Rather, Shandong's greenfield phase ran on low provisional tariffs for about one year, until 2004, when a settlement was agreed whereby the price would be set at 36 fen/kWh. This price has been paid since, but then increased slightly in 2005 due to the dramatic increase in coal costs in the domestic market.

D. Government & Multilateral Support.

Letters of support, incorporating language intended to support the offtaker's creditworthiness, provided by the Shandong Government, the SPC, the SDPC and SAFE are evidence of governmental support for the Project. There is additional implicit support as SEPCO (the corporatized provincial power bureau) is an equity sponsor, offtaker, operator and lead EPC contractor.

[82] Thomson News, *Shandong Refis Power Loan,* June 23 2004.
[83] Announcement made during CLP's first half earnings presentation to investors (Aug 2004), Hong Kong. See also data in Bloomberg database.

The project also obtained 100 percent political and commercial risk cover from the ECGD. This was the first project in which ECGD provided 100 percent cover for political and commercial risk on a limited recourse transaction in China. The ECGD-guaranteed tranche has since been taken out in the new loan.[84]

III. HOST COUNTRY CONTEXT: SHANDONG PROVINCE.

Shandong is China's 2nd most populous province and 3rd strongest industrial production base after Guangdong and Jiangsu. In 1985, most counties and towns in Shandong were designated by the state as open region to foreign investors and enjoy favorable economic policies. Like Fujian, it is the home of an independent power network.

A. Electricity Supply-Demand Situation (1997-2003)

In 1997, the amount of power generated in Shandong totaled approximately 84.03 million MWh, representing an increase of approximately 6.0 percent over the prior year and an increase of approximately 69.3 percent over the year 1991. At the time, Shandong faced a worse power supply bottleneck than Fujian, having been slower in attracting foreign investors into power generation. It was believed, at that time, that electricity supply in Shandong would grow at an annual rate of 5 percent or above during the period from 1999 to 2003 – a moderate increase in supply which will be easily absorbed by the burgeoning consumption growth. Nonetheless, estimates for 2003 suggested a shortage of installed capacity on the Shandong Provincial Grid at peak electricity demand would remain at approximately 375 MW.[85]

During 1996 and 1997, an additional 4,061 MW of installed capacity was added to Shandong (including 1,800 MW of capacity from power plants owned by SIPD). Thus, while the lack of generating capacity has eased somewhat, as at the end of 1997, per capita installed capacity of Shandong was only approximately 0.192kW, which is only 91.4 per cent of the national average of 0.21 kW per capita. At the same time, the per capita power consumption for Shandong for 1997 was approximately 959 kWh, which is approximately 6.5 per cent higher than the corresponding figure of 900 kWh for China as a whole.

B. Electricity Supply-Demand Situation (2004-5)

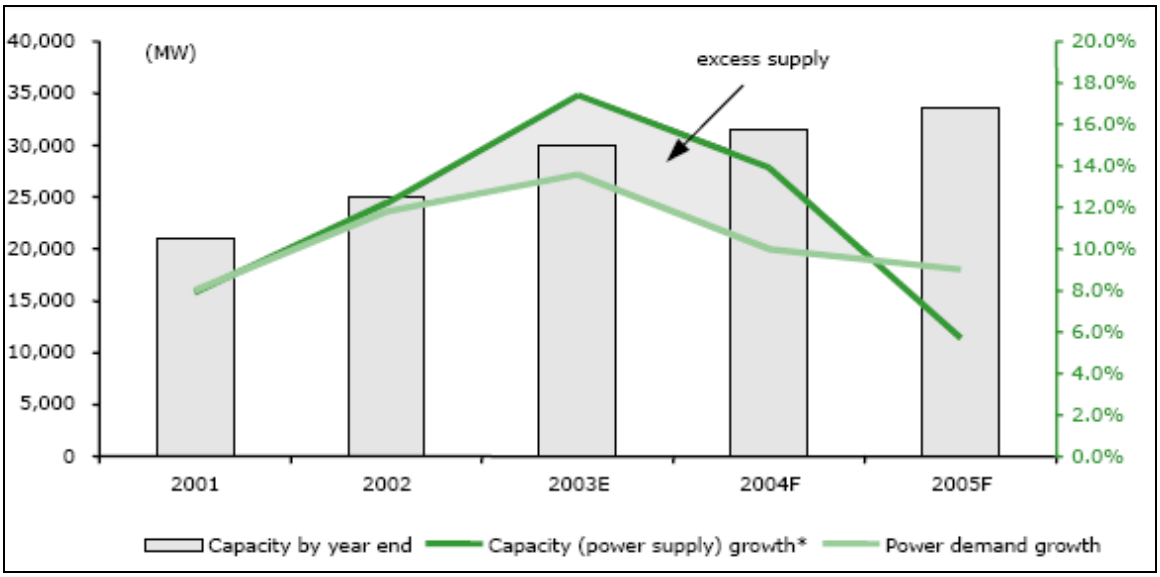
Contrary to conservative estimates, supply additions in the Shandong province went up by an estimate of 19% in 2002, 20% in 2003 and 18% in 2004.[86] This far outstripped demand growth and led to an overhand in total capacity. While specific generation and utilization metrics are unavailable for this project, we use proxy data from Huadian International ("Huadian"), which is the most major private player in the Shandong province. For the first half of 2003, Huadian's gross generation declined YoY by 6%, despite the fact that it had a capacity

[84] Thomson News, *Shandong Refis Power Loan,* June 23 2004.
[85] Goldman Sachs, *Shandong International Power Development* (1999) (Prospectus for the New Issue and Placement of H Shares on the Hong Kong Stock Exchange).
[86] UBS Equities industry report 'China Power: Increasing Risk" (Dec 2004).

addition of 20%.[87] Worst still, its utilization rate in July 2003 was pegged at 56%, versus 72% for July 2002 (July is historically the hottest month in the year).[88]

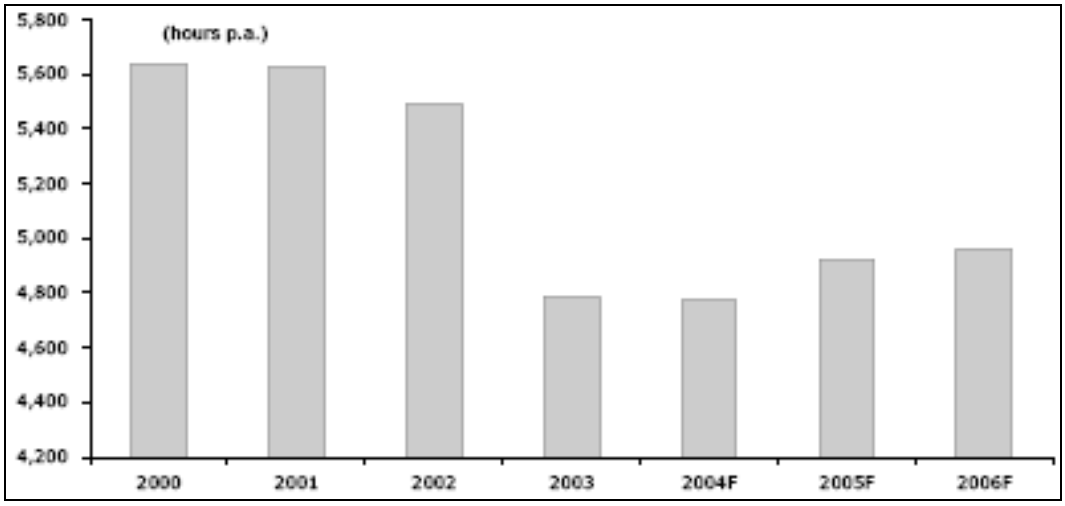
The main reason cited was over-capacity in the Shandong province – see the excess supply graphically presented in the figure on power supply-demand situation in the province. A chart showing the sharp decline in Huadian's utilization hours in 2003 and 2004 also serves as an indicator as to how the utilization hours for the Shandong Zhonghua project could have suffered in light of the power over-supply (which it probably did – see analysis of CLP earnings results in the next section).

FIGURE 1: POWER SUPPLY-DEMAND SITUATION IN SHANDONG



Source: ABN Amro Research (2004).

FIGURE2: HUADIAN'S ANNUAL UTILIZATION HOURS



Source: ABN Amro Research (2004).

[87] JP Morgan Research on Huadian International (Aug 2003).
[88] Id.

Nonetheless, the volatile supply-demand balance may be going the other way (i.e., favorably) for power producers in Shandong in the next few years. Given the over-supply situation in the province in 2004-5, capacity additions are expected to be low at 6-7% till 2006.[89] This contrasts to the national range of 15-20%. As such, there is a strong possibility that while utilization rates in other parts of the country decline; the utilization rates for power producers such as Shandong Zhonghua units start to recover to a high.

IV. PROJECT PERFORMANCE: SHANDONG ZHONGHUA.

A. Time period from 1998 to 2003

Between 1998 and 2002, only the brownfield Shiheng I and II units, with a total of 1,200MW, were operating. There was no negative news flow regarding the profitability of the Shandong Zhonghua project during this time period. Foreign investors in the Shandong Zhonghua project are profiting from revenues generated by the two existing plants. According to CLP's 2001 annual report, the total electricity output from operating plants was 2.3 percent higher (6346 GWh) than annual electricity generating capacity under the power purchase agreement.[90] CLP's profit in this project was higher during that year due to higher electricity tariffs and lower fuel costs. Moreover, no disputes or other problems were reported. Until the end of 2003, the Shandong Zhonghua project has been "making good progress".[91]

Due to continuing strong economic growth in the Shandong province and increase in power consumption during this period (e.g., an 8.23% growth in 1H02), the incremental supply of installed capacity in the past year was steadily absorbed. There were occasional concerns regarding new supply putting pressure on utilization rates and rising fuel costs by end 2002 and early 2003.[92] These were usually quelled with explanations that Shandong's demand growth would increase correspondingly with capacity additions and that higher fuel costs would not be fatal to the project since it would raise the costs base of other producers, being a common issue in the province to be resolved by local authorities.

B. Time period from 2004 to 2005

Signs that the Shandong Zhonghua project was not operating in a favorable environment started to appear in 2004, amidst a nationwide power shortage and coal supply bottlenecks. As mentioned in Part III, the Shandong province was in a different position from most other provinces in China at that time. It had to deal with its unique position of excessive power supply, as well as rapidly rising fuel costs and an inability to obtain tariff hikes to compensate the increasing costs.

The troubles besetting Shandong Zhonghua during this time were reflected in CLP's earnings. In CLP's earnings results for the first 6 months of 2004, it was reported that its

[89] JP Morgan Research on Huadian International (May 2005).
[90] CLP's Annual Report filed with the HKSE (2001).
[91] Platts Power Asia, *CLP posts modest growth*, December 11 2003.
[92] See, for example, Morgan Stanley equity research on CLP Holdings in January-March 2003.

earnings for China power projects (excluding the Guangdong nuclear and pumped storage projects) declined 75% to HK$43 million in 1H04.[93] The earnings decline may have been exacerbated by the refinancing activities of the project company (see above analysis about the refinancing charge taken by CLP in 1H04). Nonetheless, CLP's full year earnings for 2004 did not paint an optimistic picture. Excluding the one-off charge, CLP's earnings for China power projects (excluding the Guangdong nuclear and pumped storage projects) in 2004 decreased by 38% from HK$172 million in 2003 to HK$106 million in 2004.

According to CLP's Annual Report in 2004, the four plants operated by the Shandong Zhonghua project company saw an increase in coal prices of about 40% in 2004.[94] This is consistent with a nationwide trend in coal costs, which started to increase rapidly beginning in 2004. In China, the primary reason for this is a shortfall of coal supply relative to rising coal consumption by China industrial sector, especially the power, metallurgical and petrochemical industries. Due to this supply-demand imbalance, China's coal stocks fell to 98 million tons in the middle of 2004 – its lowest level in 20 years.[95] As a result, spot prices for coal, according to the Qinhuangdao index, increased by more than 40% in 2004.

An interesting issue in this case study is that a power producer in Shandong such as the Shandong Zhonghua project company faced roughly the same increase in coal prices as power producers in other regions. The interesting point is presented by the fact that the Shandong province is one of the major coal production regions in China.[96] Theoretically, the implications of locating a plant in the Shandong province means lower fuel costs owing to the savings in transportation costs. Indeed, coal transportation bottlenecks in China were a significant factor determining coal supply and rising costs during 2004-5. For example, half of the coal available in the western part of Inner Mongolia remains at the source due to transportation problems.[97] Moreover, according to the chart below presenting a breakdown of coal costs for Chinese power producers, shipping freight represents about 30% of total coal costs for a producer with plants located near the coast (Huaneng). In contrast, a Shandong producer such as HDPI (aka Huadian) incurs no shipping freight, and thus escapes portions of rising freight costs.

[93] UBS Equity Research on CLP (August 5, 2004).
[94] Supra, CLP's Annual Report (2004).
[95] Together with the neighboring Shanxi province, they produce more than 50% of the coal output in China. Asia Pulse, Profile of China's Coal Industry, October 6 2004.
[96] China Statistical Yearbook (1990-2002).
[97] Supra n.17, Asia Pulse.

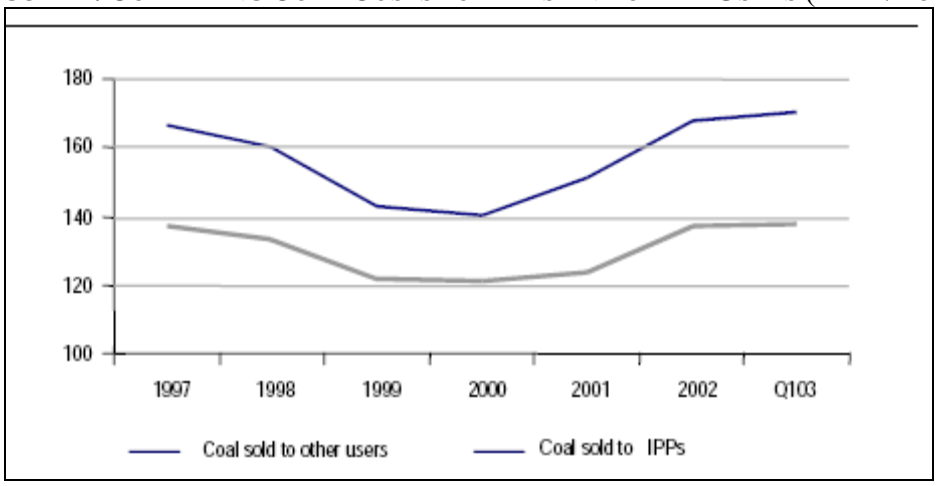
FIGURE 3: COAL COSTS BREAKDOWN OF CHINESE IPPS

	Huaneng	Datang	HPDI	CRP
Coal Supply Split				
Contract coal(%)	52%	80%	70%	75%
Spot coal(%)	48%	20%	30%	25%
Coal cost breakdown				
Pit Price	49%	71%	55%	47%
Rail Freight	20%	29%	45%	21%
Shipping Freight	30%	0%	0%	32%
Contract coal increase				
Pit Price	7%	7%	7%	7%
Rail Freight	5%	5%	5%	5%
Shipping Freight	10%	10%	10%	10%
Market coal increase				
Pit Price	40%	40%	40%	40%
Rail Freight	30%	30%	30%	30%
Shipping Freight	70%	70%	70%	70%

Source: Morgan Stanley Equity Research (August 2004).

There are two possible explanations for this situation. First, while the Chinese coal industry is gradually deregulated since the 1990s, some official controls remain to ensure that the price of coal sold to power plants is lower than that for other industrial users.[98] As the chart below demonstrates, the difference between market price and the price paid by IPPs differs significantly. Such artificial restrictions on price created a situation in which coal suppliers refused, to some extent, to sell coal to power plants.[99]

FIGURE 4: COMPARING COAL COSTS FOR IPPS AND OTHER USERS (RMB/TON)



Source: UBS Equity Research (Dec 2003)

The second explanation may lie in coal suppliers reneging on arrangements to supply coal in order to collect higher spot prices in other regional markets.[100] It is unclear whether such arrangements are formal contracts in the case of the Shandong Zhonghua project. Since SEPCO bore the responsibility for securing fuel supply, it could have entered into informal "contract" arrangements like most other Chinese power producers. In December of each year, power and

[98] UBS Research, *Is China's Coal Shortage Temporary?* December 1 2003.
[99] Interview with unidentified official with the China Coal Industry Association, July 2004.
[100] Id.

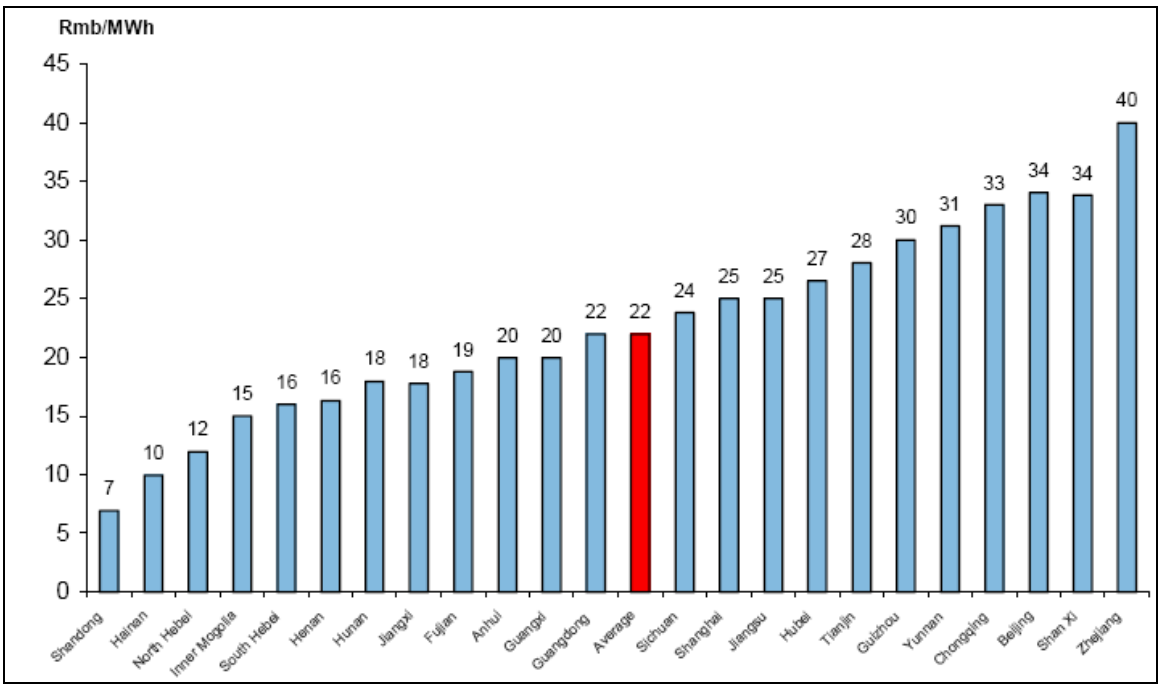
coal producers participate in an annual coal conference, whereby parties negotiate for a volume of coal to be purchased and supplied at a fixed price for that year. These are, nonetheless, "soft agreements" which do not carry legal sanctions.[101] Given a higher than 40% rise in spot market prices, it is logical that coal suppliers may insist on a higher price, or sell to power plants in other provinces.

In the face of rising coal costs, all plants in the Shandong province were dealt another blow; they were not given timely tariff hikes, unlike plants in the rest of the country which had their tariffs revised upwards twice since the beginning of 2004 to compensate for rising coal costs. A possible reason is that the Shandong province did not require tariff hikes to encourage power producers to increase power generation, given the excessive power supply in the province. Consequently, the Shandong Zhonghua project only received upward adjustment in its tariffs in 2005, and only for the new plant. The tariff remains 41.0 fen for Shiheng I and II; and 37.85 fen for Heze and Liaocheng.[102] As noted previously, the 36 fen/kWh figure is a substantial discount against the contract price for Heze and Liaocheng. Initially, Shandong Zhonghua's sponsors were able to absorb the impact of 36 fen for the Heze and Liaocheng units by making a range of adjustments, including reductions in payments to SEPCO for operations and fuel services under the OOC. As coal prices began to rise, the company has been unable to pass-through the full cost of these increases (*see below*), and has seen earnings decline. Industry sources suggest that the earnings of the project company remain significantly affected.[103]

Nonetheless, this issue should also be viewed in the context of tariff rebalancing in the Shandong provincial grid. It appears that the scope for tariff hikes in the Shandong region was limited, varying from zero hikes for certain Shandong plants to a larger hike for certain units with retrofitted desulphurization facilities.[104] This may be partly attributed to the low rate of end-user tariff adjustment in the Shandong province, which is pegged at an average of RMB7/MWh – the lowest adjustment in China in mid 2004. However, there may be more scope for greater tariff hikes in the near future, since the Shandong provincial government is currently taking more steps to raise end-user tariffs. Starting from May 1 2005, domestic electricity charges will increase by 0.02 yuan per kWh and industrial users will be charged an additional 0.027 yuan.[105]

[101] Presentation by Huaneng Power International in its 1H04 earnings release.
[102] Id.
[103] See equity research reports from UBS, Deutsche, etc, about CLP in 2004.
[104] JPM Morgan Research, China vs. Indian Power Sector (2005).
[105] Asia Pulse, *Chinese Provinces Consider Raising Electricity Rates,* May 10 2005.

FIGURE 5: A COMPARISON OF END-USER TARIFF ADJUSTMENT IN CHINA



Source: Morgan Stanley Equity Research (August 2004).

Under the PPA signed between the Shandong Zhonghua project company and its offtaker, changes in coal prices should pass through to the tariff. However Shandong Zhonghua has not been able to secure tariff adjustments according to these terms. Rather, the process of tariff setting has involved lengthy negotiations with Provincial and State authorities and is essentially based on what the offtaker can afford within the Provincial grid. A deeper issue surfacing from this is: while coal prices have been largely deregulated in China, electricity tariffs remain under strict control of the government, causing an economic distortion.

Next, the swing towards excessive supply in the Shandong province exacerbated the situation of rising coal prices and inadequate tariff hikes. As detailed in Part III, the Shandong province faced over-supply in 2004-5 at a time when other parts of the country were in a perpetual state of power shortage. Thus, while the 5500 target utilization hours have been met thus far, the project was unable to cut its losses through higher utilization rates and increasing top-line growth. In contrast, local power producers such as Datang International Power, with plants in the Beijing, Tianjin and Tangshan area, saw its turnover increase by over 34% and year-on-year increase in power generation by 38% and an earnings growth of more than 40% in 2004, despite rising coal costs.[106]

Overall, it appears that the fortunes of the Shandong Zhonghua project have been very much tied to the actual economics of the electric power market in which it was situated. Its profitability rose at a time where demand growth outpaced capacity additions, and declined where the opposite situation occurred. Moreover, while it has a costs pass-through provision in

[106] Platts Power Asia, Coal costs hit Chinese generators, September 16 2004.

the PPA, its position was affected significantly by rising fuel costs (which make up about 50% of its costs base) and lower tariff hikes approved by the provincial government. This means that the Shandong Zhonghua project was essentially a merchant plant caught in an environment of economic distortions.

Nonetheless, we argue that this project is merely in the middle of the spectrum of success-failure, given the lack of major disputes between parties and that it has seen better days when the supply-demand situation was favorable and would, in fact, see them again as the supply-demand imbalance begins to rectify itself in due course. While EDF has largely cooled on the Chinese power market, the other major foreign sponsor, CLP, continues to develop new projects. Available information and feedback from industry participants indicates that further development of IPPs in China will occur on a very different basis than during the 1990s. Because long-term contracts are of little value and not always available, any developer—domestic or foreign—will have to rely on independent assessments of the market risks and likely offtake position. There are no guarantees, although the process of project approval by the National Development and Reform Commission Authority provides some basis for arguing the case on tariff and offtake hours. CLP is developing a new project in Guangxi Province on this basis, at least in part to demonstrate that it is able to operate within today's commercial and regulatory environment. CLP officials note that eventually the company must become a local player in each of its markets; China, in particular remains a critical strategic market for the Hong Kong utility.

The Guangdong Shajiao C Project[107]

Project Specifications			
Capacity	1980MW	**Financing**	1992
Fuel	Coal	**COD**	1996
Project Cost	US$1,774 million	**PPA Term**	20 years
		Ownership	Joint Venture

Sponsors (original)	Guangdong Shajiao (60%), Resources Shajiao C Investments (40%)*
EPC Contractor	GE-Alstom
Operator	Guangdong Shajiao
Multilateral involvement	None
Offtaker	Guangdong Power Bureau (*original*), South China Grid (*current*)
Lenders	

* Resources Shajiao C Investments was originally controlled by CEPA (HK), then sold to Mirant Corp. (USA) in 1997. More recently, a group of Chinese investors, including the Huaneng Group, have acquired Mirant's share. *See discussion below for more details*.

I. OVERVIEW.

This paper provides a preliminary overview of the case study on the Guangdong Shajiao C project. The basic structure of the deal involves a Sino-foreign joint venture project company owning the generation asset and selling electricity to the Guangdong provincial grid under a PPA drafted to international standards (i.e., with major terms such as minimum offtake, tariffs determination mechanism, fuel costs pass-through, etc). Shajiao C has been selected for analysis because it is considered to be in the midpoint of our outcomes spectrum. The project has run into some issues during the period of its ownership and management by the foreign IPP, but these issues were mainly technical. Problems attributable to the regulatory framework and investment climate, such as tariff disputes were in fact mitigated with well-structured joint venture arrangements. Further, the foreign IPP managed to exit the plant eventually through a sale to a domestic company at an acceptable price.

II. PROJECT HISTORY.

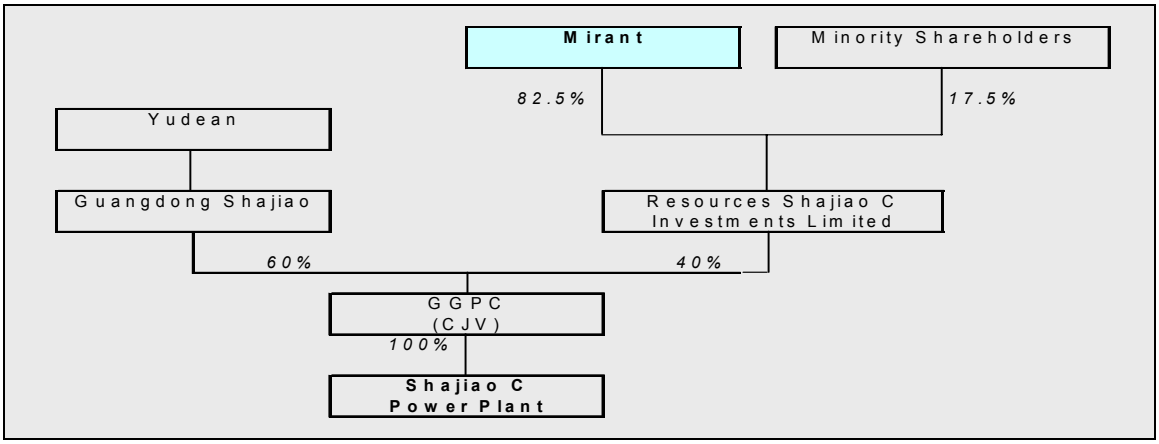
The Shajiao C project was developed by Consolidated Electric Power Asia ("CEPA") which was owned by Hong Kong's Hopewell Holdings, a conglomerate which has a construction arm. This project was initiated after CEPA's successful completion of Shajiao B where CEPA received a US$53 million cash bonus for early completion and made an estimated 25-30% ROE.[108] It is worth note that CEPA was not an experienced IPP in the market, but more of a construction contractor. The Shajiao projects were mainly premised on the well-developed relationships between Gordon Wu, founder of Hopewell Holdings, and the local official and state enterprises. As a result, the project was structured in a way with the government and state enterprise partners in the project being exposed to a significant portion of the risk in terms of power purchase, fuel supply, tariffs, and foreign exchange convertibility.

[107] This project study was prepared by Pei Yee Woo, drawing on selected interviews with officials of Mirant Corp. as well as public industry sources.

[108] Handley, BOT Privatization in Asia: Distorted Goals and Processes (National Library of Australia Working Paper No. 82, 1997).

Shajiao C did not prove to be such a lucrative project for CEPA, as the latter missed the early completion bonus worth US$400 million owing to turbine problems. In late 1996, a financially troubled Hopewell sold the majority stake in CEPA, the holding company for Shajiao C and some other plants, to Southern Company, the predecessor of the spinoff company known today as Mirant.[109] CEPA was then considered the "crown jewel" of Hopewell – CEPA's earnings were up 13% year-on-year in 1996, reflecting the strength of its operations, while Hopewell's consolidated earnings plunged around 12% at that time.[110]

FIGURE 1: SHAJIAO C OWNERSHIP (1996-2002)



Source: CRP

Mirant owned 33% of the project and had management control of the project till December 2002.[111] Between 1998 and 2001, while many other plants were suffering from low generation output as a result of the Asian financial crisis, this plant mainly faced start-up glitches and technical problems.[112] The plant suffered a series of extended forced outages in 1996-98 and 2000-01, affecting its generation output and availability.[113] In October 2000, the main transformer of Unit II of the plant failed and that unit did not resume operations until mid July, thereby adversely affecting the amount of generation output. This technical failure resulted in a significant drop in the generation output (24%) and a 47% net profit contraction.[114]

During this time, there have been no indications from the players that there were any PPA disputes with the offtaker. However, towards 2002, Shajiao C, like many plants in Guangdong, was involved in negotiations with its offtaker regarding tariffs reduction owing to a tariffs rationalization exercise across the province. The Guangdong Provincial Price Bureau insisted on reducing the tariffs for Shajiao C from the agreed RMB415.1/MWh to RMB346.8/MWh (a 16.4% reduction).

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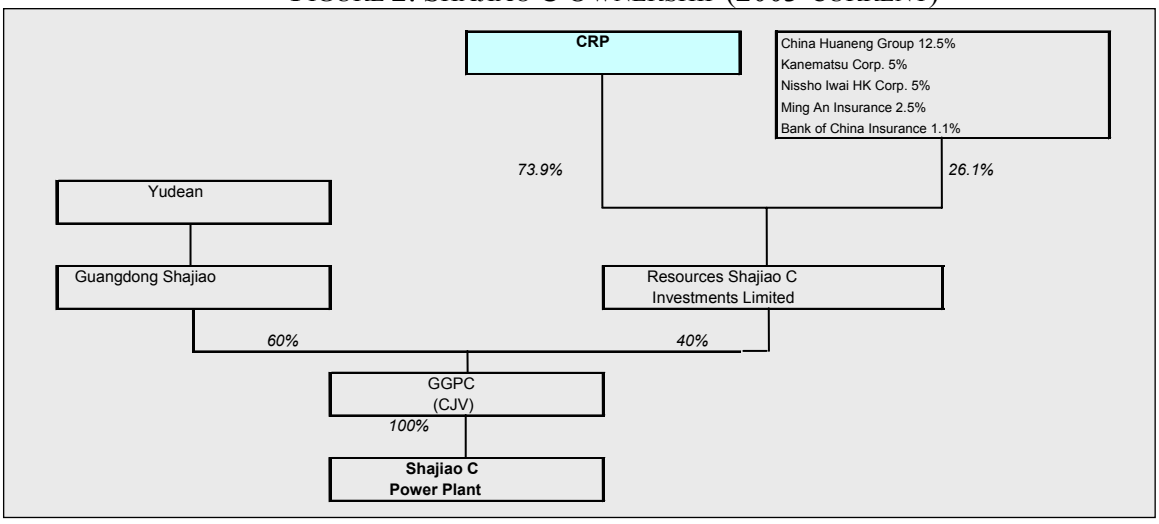
[109] CEPA's New Plant Earnings Approach, South China Morning Post, Oct 27 1996.
[110] CEPA SALE KEEPS HOPEWELL UPBEAT AMID HEAVY PROFITS FALL, Financial Times, Oct 11, 1996.
[111] See generally Mirant's SEC filings.
[112] ELECTRICITY INDUSTRY - SOUTHERN CO.: Asia Opportunities Prove Tough To Grasp, Daily Energy Briefing, July 6 1998.
[113] Morgan Stanley Research, A New Breed of Power Merchant (Jan 2004).
[114] *Id.*

At the end of 2002, there were two major changes to the project. First, Mirant's partner (a corporatized state-owned enterprise) and offtaker, which was originally the related Guangdong Electric Power Bureau and Guangdong Power Company respectively, was changed to Yudean and Guangdian (which on-sells power to the China Southern Grid).[115] This was a result of a wave of reforms intended to break a growing trend towards local protectionism (whereby local power companies and bureaus work hand in hand, often to the detriment of outside investors) and introduced a series of changes, including the breakup of the national grid entity into the State Grid Corp and the China Southern Grid. Note that this set of restructuring reforms was implemented nationwide, not being Guangdong-specific, and several other projects, including the Shandong Zhonghua project, were affected by a similar issue involving a change in the identity of their Chinese partner and offtaker.

FIGURE 2: SHAJIAO C OWNERSHIP (2003-CURRENT)



Source: CRP

Second, in 2001-2, Mirant put its stake in Shajiao C up for sale, with major bidders being CLP, Citi Pacific, Huaneng Power International and China Resources Power Holdings Co.[116] In December 2002, Mirant sold Shajiao C to China Resources Power Holding Co. for US$300 million.[117] This is mainly motivated by the need to raise money for the repayment of debts of its parent company, which entered Chapter 11 bankruptcy in 2003. Mirant said in a statement released on December 31, 2002 that the sale of Shajiao C boosted its liquidity to US$1.4 billion and eliminated a US$254 million loan at its Asian subsidiary.[118]

115 See Approval on the Implementation Plan of Guangdong Province's Reform of Power Industry Structure Relating to Separation of Generation and Transmission Assets, a document issued by the Guangdong provincial government in 2001. According to this document, the shares of the company formerly held by Guangdong Power Holdings Co. were transferred to the Yudean Group Co. Ltd.

116 Power players eye 33pc of Shajiao C - Mirant sale sparks a battle for slice of the Guangdong market, South China Morning Post, Nov 27 2002.

117 The shareholders of Resources Shajiao C Investment are now: China Resources Power (73.9%), China Huaneng Group (12.5%), Kanematsu Corp (5%), Nissho Iwai HK Corp (5%), Ming An Insurance (2.5%), and Bank of China Insurance (1.1%).

118 China Resources Power buys plant stake from Mirant, January 2, 2003.

III. THE GUANGDONG ELECTRIC POWER MARKET.

Guangdong is the economic hub of the Pearl River Delta Economic Zone, with the highest electricity consumption in China. Though the province exports electricity to Hong Kong and Macau, it is a net electricity importer, being interconnected with regional and provincial grids in southwest China. In 2003, imports from Southwest China accounted for around 10% of Guangdong's power consumption needs. Table 1 below presents some basic data about this market.

TABLE 1: GUANGDONG PROVINCE BASIC DATA	
Population (million)	80
Installed Capacity (MW)	43,570
Capacity/capita (MW)	507
Consumption (billion kWh)	199.0
Consumption/capita (kWh)	2,314
Generation output (billion kWh)	178.0
Net import (billion kWh)	21.0
% Hydro Capacity	6.4%
Hydro output	11.4
End-user Tariffs	732
Provincial GDP (RMB billion)	1,345
Provincial GDP 3-year Compound annual growth rate ("CAGR")	11.7%
Provincial Power Demand 3-year Cagr	17.9%
Capacity 3-year Cagr	11.0%
Avg. Demand/GDP multiple	1.53
Avg. Demand/Capacity multiple	1.63

The major disadvantage for the province in terms of power supply is its lack of natural resources. As a result, power plants have to import coal and diesel from other parts of China or overseas, exposing them to rising fuel transport charges.

IV. SIGNIFICANT DIMENSIONS OF PROJECT STRUCTURE.

A. Offtake Arrangements.

The project company entered into an Operation & Offtake Agreement with the Guangdong Power Bureau which had the following key terms: (1) term of 20 years; (2) minimum offtake of 62% of total generation capacity;[119] (3) fixed tariff of RMB415.1/MWh; and (4) fuel-cost pass-through. Payments pursuant to this agreement are structured to cover foreign currency expenses, and, in the overall scheme, the debt service and equity returns under other arrangements are pegged to US dollars.[120]

B. Joint Venture Arrangements.

[119] See limited discussion of offtake arrangements in China Resources Power's prospectus of share issuance filed with the Hong Kong Stock Exchange in 2004 ("the CRP prospectus").
[120] Southern Company's prospectus for share issuance filed with the SEC in 2000.

Under the joint venture agreement, the profits from the plant's operations were to be used first to repay loans and repatriate the registered capital of each shareholder. During the first 10 years of operation, 30% of the remaining profits would be maintained in a special electricity fund to be allocated for the benefit and welfare of the employees who participate in the management of the plant. Of the remaining 70%, 40% would be allocated to the foreign IPP and 60% to the Chinese partner. An important feature is that, given the unique tariffs determination mechanism in China (e.g., annual tariffs review, etc), the Chinese partner would be obliged to make whole any shortfall suffered by the foreign IPP in the event of a tariffs adjustment.[121]

C. Operation & Maintenance Arrangements.

Under the Operation & Offtake Agreement, the plant is operated by the Chinese partner, which is entitled to an operating fee for the operation and maintenance of the plant, as well as the securing of its coal supply.[122] The fee, which includes a coal portion and an operating portion, is calculated by multiplying total output dispatched by operating fees per kWh. Operating fees per kWh is negotiated between the shareholders to the joint venture and varies annually.[123]

D. Fuel Supply Arrangements.

Fuel is sourced from Inner Mongolia, which is then transported by rail to Qinhuangdao port and then shipped to Guangdong. Part of the coal is also purchased from the international spot market. While the price of coal for coastal plants increased by about 15-25% recently, this increase was passed on to Shajiao C's offtaker under the PPA.

V. PROJECT PERFORMANCE: SHAJIAO C.

We consider the Guangdong Shajiao C project as occupying a middle ground between positive and negative outcomes. The project faced two major problems during the period when it was under the ownership and management of the foreign IPP. As discussed above, generation output and availability were affected by mechanical problems; and the project faced tariff reduction towards the end of 2002. Nonetheless, most of these issues were mitigated by the contractual structure and by good project management.

First, owing to technical difficulties with the turbines, the required minimum offtake was not achieved during between 1996 and 1999. However, the impact of these technical problems on project earnings has been limited. Capacity payments associated with the shortfall were provided for under the offtake arrangements and were duly paid by the offtaker.[124] Further, the project company may be able to recover lost earnings owing to forced outages under a business interruption insurance policy with the People's Insurance Company

[121] See limited discussion of joint venture arrangements in the CRP prospectus.
[122] See generally Mirant's SEC filings.
[123] See limited discussion of operation and maintenance agreements in the CRP prospectus.
[124] Interview with Paul Reynolds, Mirant Corp., Jan 2003.

of China. The project company is currently suing the insurer on a claim of over US$100 million.[125]

Third, in relation to the tariffs issue, while the project company suffered a 16.4% reduction in its tariffs in 2003, there were ongoing negotiations before the sale of Mirant's stake to China Resources Power regarding the provision in the joint venture arrangement that required the Chinese partner to "make whole" the foreign IPP for losses flowing from adverse host government action.[126] This feature, which ensured stable revenues, must have been taken into account in the valuation of the stake in the sale. In addition, given domestic interests involved, there were constant negotiations throughout 2003-4 by the Chinese partner with the Guangdong grid to reinstate the agreed tariffs. Coupled with the fuel cost pass-through provision which protected the project from rising coal costs in 2003-4, this project, while not "wildly profitable", has been relatively well-shielded from the downside risks (or what we analyzed as "Category A" factors in the general country study), given the comprehensive project structure.[127]

The foreign IPP exited smoothly from the project at the end of 2002, basically motivated by its parent company's woes and not because of the ills of China's power industry. A former company manager said that the sale was done for a fair price and Mirant mildly profited from this project, as the project had a relatively frontloaded cash flow profile.[128] According to Mirant's SEC filings in 2003, the gross proceeds from the sale of the Shajiao C project totaled US$300 million and its gain on the sale was US$91 million.[129] This meant that, for accounting purposes, the book value of Mirant's investment in Shajiao C as of the time of sale (December 2002) was US$209 million, and the gain would seem to represent a 43.5% premium over the value of the asset.

A possible explanation is: this represents a goodwill premium paid by China Resources Power above the fair market value of the asset (representing the intangible value of the acquired asset's ability to generate additional profits). Given Mirant's "brand name", the well-structured project package and the fact that there was much competition between prominent bidders (including CLP) in acquiring the asset, it is not surprising that a goodwill premium would exist. A 43.5% premium, however, seems excessive, especially since a closer look at Mirant's financial statements revealed an impairment charge related to the Shajiao C project, which should have rendered the book value of its investment in the project to be a mark-to-market value.

Prior to the sale in the fourth quarter of 2002, Mirant recorded a huge impairment charge of US$697 million. Mirant attributed this charge primarily to the loss of future cash flows associated with "certain Asian assets" to be sold during the year (namely the German Bewag and Shajiao C projects), and principally in relation to their investment in the Shajiao C

[125] Supra, n 113.
[126] Interview with Paul Reynolds, Mirant Corp., Sep 2004.
[127] Interview with David Taylor, Mirant Corp., July 2004.
[128] Interview with David Taylor, Mirant Corp., July 2004.
[129] See Mirant's 2003 annual report filed with the SEC.

project.[130] Mirant's explanation for this impairment charge, and the value of the charge, if principally attributed to its investment in Shajiao C, compared to the US$209 million book value, seem odd. Usually, the future cash flows of a project would have been taken into account (albeit discounted in various aspects) in its valuation for the sale to the acquirer, though it was possible that such future cash flows have been heavily discounted by the acquirer and thus "lost". As such, we view Mirant's gain on the sale with caution and tend towards the view that the Shajiao C project is in the midpoint of success and failure for its foreign investor.

Nonetheless, from a general perspective, the Shajiao C project is one of the rare projects in China which has not suffered from what we analyzed as "Category B" factors in the general country study. Possible reasons for this could be the huge involvement of the Chinese partner (which takes 60% of profits after relevant deductions and where 30% of the initial profits are allocated into a special electricity fund for the benefit of Chinese employees[131]), and its location in one of the fastest-growing and the most prosperous province in China.

In the aftermath of Mirant's sale of its stake, the Shajiao C project seemed to be performing well. In 2004, the plant received governmental approval to recover all its lost revenue since July 1, 2002, when the mandatory tariff reduction was imposed by the Guangdong grid authority.[132] Furthermore, China Resources Power subsequently announced in October 2004 that governmental regulators approved price adjustments of 6 yuan/MWh for all coal-fired plants serving the Guangdong grid, including the Shajiao C plant, and that the generation output of the plant had increased by more than 10% year-on-year in 2004.[133]

[130] *Id.*
[131] See limited discussion of profit allocation scheme in the CRP prospectus.
[132] China Resources 03 Profit Soars On Rev Rebate, DJ International News, Mar 30 2004.
[133] China Resources Power Plants In Guangdong Hike Rates**,** DJ International News, Oct 13 2004; China Resources Power Holdings Total Net Generation 32.913 Bln kWh 2004, China News Digest, Jan 13 2005.