

State Power and the Logic of Reform in China's Electricity Sector

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“Our [power] plant no longer needs imported equipment or skills. ...Recalling the past, [veteran machinery maintenance man] Lu said, ‘Under imperialist control, all important technical data was withheld from Chinese workers. ... Today all the technology is in our hands. And we run our plant ten times better than the imperialists!’”

“Shanghai’s biggest power plant—then and now,”
China Reconstructs, June 1965¹

“[T]aking the reference of experience and lessons regarding power sector reform both home and abroad, we shall ... allocate resource [sic] based upon market oriented system ... and set up the power sector structure which is [in] line with [the] socialist market economy. ... We believe the coming reform will offer more investment opportunities and market space. We welcome global investors to continue with your interest to actively participate in the development of the PRC’s power industry.”

Executive vice president of China’s
State Power Corporation, Xie Songlin,
addressing the Annual Meeting of
the Asian Development Bank, May 2002²

Introduction

China’s electric power sector appears to have made a dramatic U-turn over the past four decades, from declarations of socialist self-sufficiency, central planning and freedom from “foreign imperialists” to the embrace of foreign investors, global markets and the international trend in utility restructuring. Most recent analyses of China’s electric power sector have focused on the technical and economic aspects of these changes,

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1 Yu-chu Ni, “Shanghai’s Biggest Power Plant—Then and Now,” *China Reconstructs* (June 1965), pp. 11-14.

2 Shanghai, May 8, 2002. The presentation is available at the Web site of the Asian Development Bank, at <http://www.adb.org/AnnualMeeting/2002/Seminars/presentations/songlin_paper.pdf>, site last accessed 6 February 2004.

measuring the current situation against the assumed end goal of welfare-maximizing efficiency.³ In contrast, this article attends explicitly to the larger historical and political-economic contexts of electricity reform, highlighting the importance of such questions as: How much control are the Chinese Communist Party (CCP) and state really willing to relinquish over electricity, that fundamental building block of the modern industrial economy? What consequences could the restructuring of the electricity sector have for the larger trajectory of national economic reform? How are current decisions about electricity guided by political considerations, and how might these decisions in turn affect political stability, economic development and state power?

China's gargantuan electricity sector faces immense problems. Although China currently ranks second in the world in both installed generating capacity and annual power generation (385 million kilowatts [kW] and 1.9 trillion kilowatt hours [kWh] at the end of 2003), per capita electricity consumption is only 10 to 15 percent that of developed countries. The Chinese government estimates that economic growth and rising energy consumption will necessitate an expansion of installed power generating capacity to 900 million kilowatts by 2020.⁴ This not only has tremendous local and global environmental implications, but also poses a huge technical challenge for a sector plagued by inefficient state-owned enterprises, aging capacity and transportation bottlenecks. The government is now seeking to attract foreign investment to finance the need for new capacity.

But this is only part of the picture. Despite the introduction of economy-wide market reforms, which have resulted in competition, more realistic price signals and increased foreign trade and investment, government involvement remains strong. Combined, the state's unwillingness to fully relinquish control over the power sector and the technical constraints of restructuring constitute a specific logic of electricity reform with internal contradictions that are likely to become more apparent in coming years. First, while the state seeks to improve efficiency in electricity generation by introducing competitive markets, it also continues to set electricity tariffs. Furthermore, despite the desire to attract foreign investment in new generation capacity, the state continues to impose limitations on foreign ownership. Foreign investors remain wary about the lack of standardized power purchase agreement (PPA) procedures and sufficient legal mechanisms to enforce contracts once signed.⁵ In addition, while the recent separation of regulatory and power-generating functions of Chinese power companies appears to follow the global trend towards privatization, ex-

3 See, for example, Yanrui Wu, "Deregulation and Growth in China's Energy Sector: A Review of Recent Development," *Energy Policy* 31 (2003), pp. 1417-1425.

4 "China outlines future electrical grid," *Financial Times Information*, 12 September 2003.

5 Phillip Andrews-Speed and Stephen Dow, "Reform of China's Electric Power Industry, Challenges Facing the Government," *Energy Policy* 28 (2000), pp. 335-347, in particular p. 340.

government officials, or current officials' close relatives, still dominate the now "private" power companies. Also potentially troublesome are large and growing regional disparities. In some places local power companies have embraced entrepreneurial opportunities, while in others new construction and investment in generation have been halted in the face of an uncertain economic future.

This article explores these contradictions, both to analyze the direction in which the power sector is heading, and as an angle from which to study China's larger trajectory of political and economic change. We turn first to the historical legacies and physical constraints faced by the Chinese state as it charts a course for electric power restructuring. Following this is a discussion of the political-economic logic of electricity sector reforms. Finally, this logic is used to examine four key issues facing the Chinese state vis-à-vis power sector restructuring: recurring shortages and surpluses, price distortions and market manipulation, institutional reorganization and inter-regional equity. This analysis is necessarily limited by the lack of transparency in state decision-making processes.

Historical legacies and constraints on China's power sector

Resource constraints

The world's third largest country in terms of area, China has a rich supply of coal and hydropower potential for electricity generation. With 11 percent of the world's proven coal reserves, China has been the world's largest coal producer and consumer since 1988.⁶ As a result, coal dominates the country's power generation, accounting for 74 percent in 2001.⁷ However, there is a substantial mismatch between the geographic distribution of these rich resources and China's major centres of population, industry and economic growth. Both the highest quality and highest concentration of coal reserves are generally found in the north, while hydropower potential is concentrated in the southwest. However, the energy-hungry and economically dynamic areas of south-central and eastern China only have about nine percent of national coal reserves.⁸ The transportation of power over thousands of kilometres from the economically underdeveloped west and north to the major load centres of the east and south adds significantly to the cost of electricity supply and is a major constraint on the development of the power sector.⁹

6 Energy Information Administration, US Department of Energy. Data available at the Web site of the Energy Information Administration, at <<http://www.eia.doe.gov/emeu/iea/table82.html>>, site last accessed 11 February 2004.

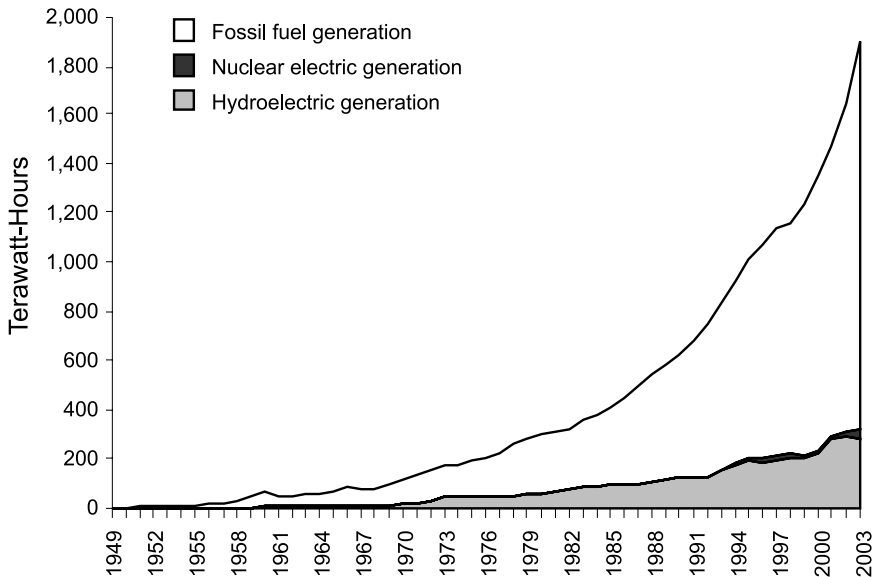
7 National Bureau of Statistics, *2002 Zhongguo Tongji Nianjian* [China Statistical Yearbook] (Beijing: China Statistics Press, 2002).

8 Yingzhong Lu, *Fueling One Billion: An Insider's Story of Chinese Energy Policy Development* (Washington: Washington Institute Press, 1993), p. 5.

9 Vaclav Smil, *Energy in China's Modernization—Advances and Limitations* (New York: M.E. Sharpe, 1988).

Recently, the Chinese government has begun to stress fuel diversification for electricity generation in order to mitigate some of the environmental and health impacts of coal burning. Plans emphasize the development of natural gas and additional hydropower through projects including the west-east gas pipeline, which is to start transmitting 12 billion cubic metres of natural gas annually from Xinjiang to Shanghai by the end of 2004,¹⁰ and the 18,200 megawatt (MW) Three Gorges Dam, with an expected completion date of 2009. Because only about 10 percent of China's total hydropower potential had been tapped as of 1995,¹¹ the Open Up the West (*Xibu dakaiifa*) programme launched in 1999 calls for the development of hydropower in the western provinces. The official estimate of total recoverable hydropower in those provinces is 270 million kW, about 72 percent of the country's total.¹²

Figure 1. Gross electricity generation since 1949¹³



10 "West-East Pipeline Begins Supplying Gas to Shanghai," *People's Daily Online*, 2 January 2004. Article available at the paper's Web site, at <http://english.peopledaily.com.cn/200401/02/eng20040102_131713.shtml>, site last accessed 11 February 2004.

11 Andrews-Speed and Dow, "Reform of China's Electric Power Industry," p. 336.

12 Launched by Jiang Zemin in 1999, *Xibu dakaiifa* encompasses 12 provincial level units, including five autonomous regions (Tibet, Xinjiang, Ningxia, Inner Mongolia and Guaxi), six provinces (Sichuan, Gansu, Qinghai, Yunnan, Guizhou and Shaanxi) and Chongqing municipality. The total area defined as "the west" occupies 56 percent of China's land area and is home to 23 percent of its population.

13 National Bureau of Statistics, *Zhongguo Tongji Nianjian 2003* [China Statistical Yearbook] (Beijing: China Statistics Press, 2003). National Bureau of Statistics, *China Statistical Abstract 2004*, Beijing: China Statistics Press, 2004).

Historical trajectory of electric power production

1. Electricity before the PRC

The Chinese electricity sector was first established in Shanghai in 1882, by an American-built power plant with a generating capacity of 654 kW.¹⁴ Located in only a few coastal cities, early power plants had a small capacity, and were generally built and owned by foreign companies such as General Electric and Westinghouse.¹⁵ By 1937, 461 power plants had been built, with a total generating capacity of 630 MW. Of these, 95 percent were owned by foreign interests, including Japan (59.5 percent), United States (34.8 percent), as well as British, German and French investments.¹⁶

The nationalization of these plants after the founding of the PRC was an ideological victory for the Party. An example is a British coal-fired plant built in Shanghai's International Settlement in 1913 and sold in 1927 to the US Electric Bond and Share Corporation (EBASCO).¹⁷ In 1929, the enterprise was renamed the Shanghai Power Company; its total generating capacity of 16.1 MW was the largest in Asia at the time.¹⁸ The US-owned company floated bonds and issued shares between 1930 and 1935, and in the words of the official state publication *China Reconstructs*, in 1964, "virtually without spending a cent, the US monopoly capitalists got control of what was then the largest power plant in the Far East."¹⁹ After the Shanghai Military Control Commission took over and renamed it the Shanghai Yangshupu Power Plant in 1950, it became the site of "many heroic fights against the imperialists" and its successful operation was deemed "our answer to the imperialists."²⁰ The CCP no doubt believed it would never again allow foreign ownership and operation of power plants.

2. The Maoist period (1949-1977): "Walking on two legs"

Total power generation capacity by the founding of the PRC in 1949 is variously reported as 1.85 gigawatts (GW) or 1.69 GW, with 4.31 billion kWh of electricity generation per year. By comparison, the US that year had 64 GW of capacity and 269 billion kWh of net generation.²¹ Recognizing

14 Yi-chong Xu, *Powering China: Reforming the Electric Power Industry in China* (Dartmouth: Ashgate, 2002), p. 51.

15 "Edison lights the Bund," *Shanghai Star*, 7 February 2002.

16 Xu, *Powering China*, p. 51.

17 EBASCO, like GE, was part of the J.P. Morgan family, and was a very important company in its day.

18 "The Top of Yangpu District in History," article available on the East Shanghai government Web site, at <<http://www.eastshanghai.gov.cn/English/yp/2001-8-22/1.htm>>, site last accessed 14 January 2004.

19 Ni, "Shanghai's Biggest," p. 11.

20 Ni, "Shanghai's Biggest," pp. 11, 14.

21 Chi Zhang, "Reform of Chinese Electric Power Market: Economics and Institutions," paper presented at the Stanford conference on the political economy of market power reform, hosted by the Stanford Institute for International Studies, Stanford, CA, February 19-20, 2003, p. 1; Vaclav Smil, "Energy in China: Achievements and Prospects," *The China Quarterly* 65 (March 1976), pp. 54-81.

electricity as a crucial component of the centrally planned economy, along the lines of Lenin's 1920 proclamation that "Communism equals Soviet power plus electrification," the central government projected future electricity demand and attempted to meet this demand by operating plants, allocating annual production quotas, and planning new supply. These projections were based on estimates by government planning commissions that were hierarchically arranged from Beijing to the provinces and down through lower levels of government as well as across industries. Throughout this period, electricity prices were used for accounting purposes rather than as a means for allocating resources.²²

The First Five Year Plan (1953-57) followed the Soviet model of large-scale, centralized projects. This included the construction of 16 new power plants "designed and built by Chinese engineers and using only Chinese-made equipment and automatic controls," but with the help of Soviet expertise.²³ After the split with the Soviet Union, Chinese energy strategy was characterized by a more general oscillation between two different tracks or "legs" of development—decentralized rural development with small-scale traditional technologies on the one hand, and highly centralized, large-scale modern projects on the other. The overall strategy encompassing both was called "walking on two legs."

a. Rural electrification—the decentralized leg

The provision of electricity to the peasantry was an important component of the CCP's programme of modernization and development. However, the emphasis on self-reliance and "learning by doing" that shaped the Chinese approach to rural energy development and electrification made it somewhat unique in its reliance on small-scale, decentralized systems.²⁴ This was particularly true for hydropower, which grew from 5 MW of total installed capacity in 1949 to 520 MW by 1960.²⁵ During the 1960s and especially the 1970s, the state provided small subsidies, and some organizational and technical support in the form of design, equipment and operator training, but focused mainly on encouraging rural communities to initiate decentralized energy systems thus promoting rural electrification with minimal state investment.²⁶ In Guangxi, for example, more than 80 percent of turbines and generators were reportedly made locally.²⁷ During this period,

22 Zhang, "Reform," conference paper.

23 Chieh-Ai Yang, "Kuantiang Power Plant: Chinese Equipment Only," *China Reconstructs* (June 1956), pp. 21-23.

24 Carl Riskin, "China's Rural Industries: Self Reliant Systems or Independent Kingdoms?" *The China Quarterly* 73 (1978), pp. 77-98.

25 Robert P. Taylor, *Rural Energy Development in China* (Washington DC: Resources for the Future, 1981), p. 163.

26 Taylor, *Rural Energy*, p. 5

27 Smil, *China's Energy*, p. 67.

coal mining was also highly decentralized, with 28 percent of China's coal production in 1973 coming from small mines.²⁸

The first major campaign for rural electrification through small hydropower was made during the Great Leap Forward (1958-60). This was abandoned during the early 1960s when rural electrification efforts started to emphasize the transmission of surplus generating capacity from industrial centres to villages. However, state policies swung back towards self-reliance during the Cultural Revolution.²⁹ The earlier hydropower campaign was quickly overshadowed by a burst of activity in 1970-1971, during which time the number of small hydroelectric stations reportedly built was greater than the total number built in the twenty years prior. An estimated 35,000 small hydro plants were completed by 1972. By 1984, more than half (1,574 out of 2,137) of China's counties had their own small hydroelectric power generating stations.³⁰ In 1986, 77.8 percent of total rural consumption was supplied by state-owned grids, with 16 percent supplied by small hydro, 4.5 percent by small coal-fired stations and 1.6 percent by diesel.³¹ The 63,000 small hydropower plants installed by 1988³² provided the power requirements of one-third of China's rural counties and 40 percent of its county-owned industries.³³ This success in locally developed small hydropower is quite unique in the world. The rural, decentralized approach helped to stimulate the development of local industry, including backward and forward linkages to industry and agriculture,³⁴ but it also resulted in the development of a large number of unconnected power grids.

According to official statistics, by 1986 about 99.4 percent of China's counties (excluding Tibet) were electrified. This statistic is somewhat misleading, however, as only about 70 percent of the 203 million households in electrified counties were connected to the grid.³⁵ More recent figures estimate that of the 70 percent of China's population living in rural areas, over 90 percent are grid electrified, and that the number of citizens who remain without electricity is between 50 and 100 million.³⁶ Regions with the

28 Smil, *China's Energy*, p. 68.

29 Taylor, *Rural Energy*, p. 163.

30 Kenneth Lieberthal and Michael Oksenberg, *Policy Making in China: Leaders, Structures, and Processes* (Princeton: Princeton University Press, 1988), p. 102.

31 Lu, *Fueling One Billion*, p. 78.

32 Riskin, "China's Rural Industries," p. 87; Smil, *China's Energy*, p. 65; Lu, *Fueling One Billion*, p. 56. Different studies vary somewhat in their definition of "small" hydro; the 63,000 figure includes plants of up to 12 MW capacity.

33 Lu, *Fueling One Billion*, p. 56.

34 Riskin, "China's Rural Industries," p. 87.

35 Lu, *Fueling One Billion*, p. 78.

36 Philip Andrews-Speed, Stephen Dow, Aijuan Wang, Jim Mao and Bin Wei, "Do the Power Sector Reforms in China Reflect the Interests of Consumers?" *The China Quarterly* 158 (1999), pp. 430-446 (p. 430); W.L. Wallace, Jingming Li and Shangbin Gao, "The Use of Photovoltaics for Rural Electrification in Northwestern China," paper presented at the 2nd World Conference and Exhibition on Photovoltaic Solar Energy Conversion, hosted by the National Renewable Energy Laboratory,

highest number of unelectrified households, particularly in Xinjiang, Qinghai, Gansu, Ningxia, Shaanxi, Inner Mongolia and Tibet, are generally characterized by low population density, large land area and highly varied income levels. Hydropower and coal-fired plants in these areas tend to service the larger urban centres rather than the rural population.³⁷

b. The centralized leg: large-scale projects and elite politics

The flip side of rural electrification has been the development of large-scale centralized projects. In part due to the massive investment of the “Third Front” construction programme of the 1960s and 1970s (see below), China has an enormous sunk cost in coal infrastructure, including mines, railroads, power plants and industrial boilers. In addition, because coal is cheap to produce and use (at least from a short-term economic perspective), it has remained dominant despite its environmental impact and the severe inefficiencies in combustion technologies.³⁸ The state continues to control coal mining, though it is facing increasing criticism regarding the numerous casualties and severe accidents among miners.³⁹

The focus on large hydropower project development likely stemmed from the desire of China’s political elite to prove that China had engineering capabilities on par with the industrialized nations. Early support for the Three Gorges Dam dates back to 1923, when Sun Yatsen ordered an investigation after hearing of its tremendous hydropower potential. Plans for the dam were serious enough that John Savage, the US Bureau of Reclamation’s Chief Design Engineer, led a major study following the Second World War.⁴⁰ Although the Three Gorges Dam may not have become as much of a weapon of elite power struggles as some other major energy projects,⁴¹ it illustrates the fundamentally political nature of all large-scale centralized electricity projects. After Mao wrote a poem in 1958 praising the Three Gorges, those who opposed the dam were persecuted as rightists. Similarly, when Premier

Vienna, Austria, 6-10 July 1998, p. 1. The paper is available at the Web site <<http://www.nrel.gov/ncpv/pdfs/photo.pdf>>, site last accessed 21 July 2004.

37 Wallace, Li and Gao, “The Use of Photovoltaics,” p. 1.

38 James H. Williams, “Reform and the Future of China’s Environment,” 1994 (unpublished).

39 “Coal Mine Accidents Kill 4,150 Workers in Eight Months,” *China Daily*, 19 September 2003.

40 Lieberthal and Oksenberg, *Policy Making in China*, p. 290; William C. Kirby, “Technocratic Organization and Technological Development in China: The Nationalist Experience and Legacy, 1928-1953,” in Denis Fred Simon and Merle Goldman, eds., *Science and Technology in Post-Mao China* (Cambridge, MA: Harvard University Press, 1989).

41 In *Policy Making in China*, Lieberthal and Oksenberg suggest that “... the Three Gorges dam project differs from the petroleum sector in that it apparently never became a political weapon in the power struggles among the top elite. Although political leaders at the level of Zhou Enlai, Mao Zedong, and more recently Li Peng became directly involved in deliberations over the project, therefore, this did not produce gross distortions by bending technical considerations to the political needs of members of the top elite” (p. 269). On the other hand, as an individual project, Three Gorges has certainly caused much more dissent within China than other projects (particularly in the time period since Lieberthal and Oksenberg’s analysis, for example with the National People’s Congress refusal to rubber stamp the project in 1989).

Zhao Ziyang, who slowed down construction plans, was purged after the student demonstrations of 1989, momentum on the project picked up again.⁴² While deliberations over the Three Gorges started and stopped throughout the Maoist period, other centralized power development projects continued. These included the Third Front as well as six large hydro-projects that were launched in 1958 and completed in 1974.⁴³ Furthermore, between 1969 and 1973, a total of 2,900 MW of capacity were added in the upper and middle reaches of the Yangtze River, as were 1,300 MW on the upper Yellow River.

3. Post-1978 reform: the institutional framework of energy

Before the nationwide economic reforms launched in December 1978, the power sector was organized as a vertically integrated state-owned utility. The State Planning Commission (with coordination from the State Economic Commission) directly controlled the production and allocation of planned quotas of electricity and other goods considered politically crucial and of national economic importance (table 1). Under the commissions, the Ministry of Water Resources and Electric Power played the most important role in electricity production. This ministry was, several times, combined and separated into its two components—water resources and electricity production—due in part to the tensions between the two sides over budgetary priorities for hydropower vs. thermal plants.⁴⁴ Lieberthal and Oksenberg's (1988) model for understanding this bureaucratic structure stresses the fragmented nature of authority under this system, particularly after Mao's death, when top leaders became less willing to use political campaigns and purges to overcome bureaucratic resistance. As a result, bargaining, compromise and trading among major ministries and provinces became increasingly necessary in the first decade of reform to build consensus and momentum for the implementation of major energy projects.⁴⁵ Bureaucratic bargaining remains important, though market reforms have somewhat lessened its scope, and actors have changed.

In 1987, reforms to separate government functions from business activities commenced, as did the gradual decentralization of central-level control through the devolution of responsibilities to provincial governments. From

42 Lu, *Fueling One Billion*, pp. 55-6.

43 Smil, *China's Energy*, p. 66.

44 Lieberthal and Oksenberg, *Policy Making in China*, pp. 94-105. The electric power and water resources side have overlapping but competing missions, different types of relations to subordinate units, different financial profiles, and different career paths for officials (p. 97). The electric power side has generally preferred coal-fired plants to hydroelectric ones, and small hydropower stations to large ones; the water side is concerned not only with hydroelectric plants but is also responsible for flood control, irrigation, drainage and transportation.

45 David Lampton, "A Plum for a Peach: Bargaining, Interest and Bureaucratic Politics in China," in Kenneth Lieberthal and David M. Lampton, eds., *Bureaucracy, Politics, and Decision Making in Post-Mao China* (Berkeley: University of California Press, 1992), pp. 33-58.

Table 1

Organizational structure of electric power sector and regulatory bodies

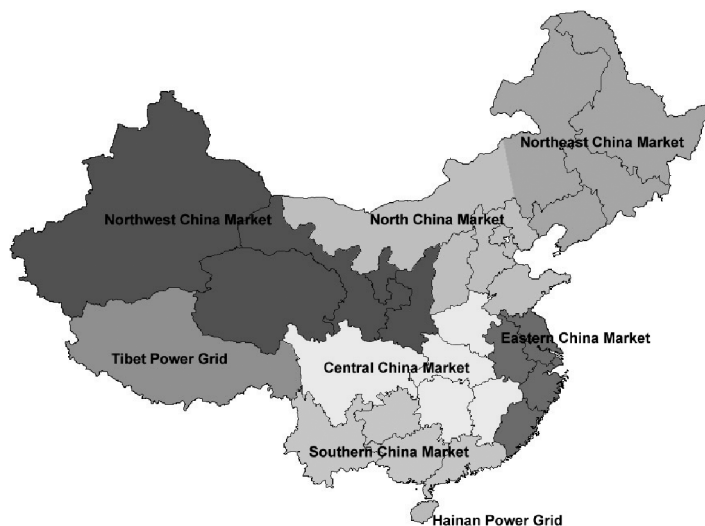
	High-level oversight	Capacity planning, price setting and regulation	Generation	Distribution	Independent regulator
1959-1988	State Council	State Planning Commission (SPC)	Ministry of Electric Power (1952-58; 1979-92); Ministry of Water Resources and Electric Power		None
1989-1997	State Council	State Planning Commission (SPC)	Ministry of Electric Power; provincial power bureaus		None
1997-2002	State Council	State Development and Planning Commission (SDPC); State Economic and Trade Commission (SETC)	State Power Corporation; five power groups; provincial power companies; city power companies; Guangdong Power Co.; Tibet Power Co.; Hainan Power Co.; Inner Mongolia Power Co.		None
2003 - Present	State Council	National Development and Reform Commission (NDRC)	Huaneng; Datang; Huadian; Guodian; China Power Investment Group	State Power Grid Corporation; Southern Power Grid Company	State Electricity Regulatory Commission (SERC)

1989 to 1997 the Ministry of Electric Power (MOEP) owned, regulated and created policy for the state power industry under the control of the State Planning Commission (later renamed the State Development and Planning Commission). Under the Ministry of Electric Power, the provincial power bureaus held monopoly power over the transmission, distribution and supply of electric power within their respective regions.⁴⁶ Major reforms began with the introduction of the Electricity Law and the affiliated Regulations for the Supply and Utilization of Power in the end of 1995.⁴⁷ Plans for 2003-2005 include the formulation of six competitive regional power markets, as

46 Andrews-Speed and Dow, "Reform of China's Electric Power Industry," p. 337.

47 "Electric Power Law of the People's Republic of China," adopted at the 17th Meeting of the Standing Committee of the Eighth National People's Congress on 28 December 1995, promulgated by Order No. 60 of the President of the People's Republic of China on 28 December 1995 and effective as of 1 April 1996. Translated law available at the Web site <<http://www.ccchina.gov.cn/english/source/ca/ca2003091814.htm>>, site last accessed 28 September 2004.

Figure 2. China's planned regional power markets for 2005⁴⁸



illustrated in figure 2. Recent organizational changes in the power sector, particularly since 1995, are well discussed in the literature; see for example Andrews-Speed and Dow (2000) and Andrews-Speed et al. (1999).

The party-state and the logic of reform

With this set of resource constraints and historical trajectory in mind, this section looks at the logic that governs current electric power sector restructuring. It first analyzes the more immediate political, economic and technical constraints and pressures that have pushed the state to consider reforms, and second, it analyzes how the structure of Communist Party and state control shape this logic.

Power reform: constraints and pressures

1. Electricity shortages

Despite slogans about the importance of electricity under the command economy, such as “electric power should be the vanguard of the economy,”⁴⁹ the performance of the electricity sector had become exceedingly poor by

48 Adapted from Yu Yanshan, “Electricity Regulatory Framework in China,” paper presented at the International Conference on Electricity Regulation in China, hosted by the State Electricity Regulatory Commission of China 17-18 September 2003, Beijing, China.

49 Lu, *Fueling One Billion*, p. 51.

the beginning of economic reforms. Increasing economic inefficiency in the power sector and a shortage of capital investment meant that by 1980, growth rates in power production lagged behind growth rates of national income.⁵⁰ In fact, up to one-fifth of industrial capacity was idle because of permanent shortages of electricity.⁵¹ The state thus had to raise the capital necessary to meet not only current needs, but also new demand generated by rapid economic growth. Despite periodic improvements, electricity shortages continue today.⁵² In sum, China's electric sector has been plagued with recurring cycles of over- and under-capacity, stemming from the limitations of the centralized planning model for balancing electricity supply and demand in a highly dynamic economy.

2. *Energy security*

Another constraint to power sector reform is persisting geopolitical concern about foreign dependency in the energy sector. In contrast to the coal industry, which was developed without much external technical assistance, oil extraction in China has long depended on foreign technological advice and capital investment.⁵³ Furthermore, China has been a net oil importer since 1993 and is projected to import about 60 percent of its oil and 30 percent of its natural gas by 2020.⁵⁴ The Chinese government recognizes these imports as a strategic vulnerability that could be exploited by foreign powers. These existing geopolitical concerns about oil as part of the energy sector make the Chinese state even more cautious about allowing foreign companies to gain control of electricity production.

3. *Development loans and international capital*

The flip side of geopolitical concerns about foreign control of crucial economic inputs is the growing involvement of international financial institutions and international consultants in China's electricity sector. Chinese officials likely felt pressured to follow international trends towards power sector reform and to acquiesce to World Bank recommendations regarding

50 Lu, *Fueling One Billion*, p. 51.

51 Smil, *Energy in China's Modernization*, p. 104.

52 "Shortage of Electric Power, an Ordeal for China's Economy," *People's Daily* (English Edition), 28 July 2003. Article available at the Web site <http://english.people.com.cn/200307/28/eng20030728_121094.shtml>, site last accessed 28 September 2004; Le-min Lim and Xiao Yu, "China races to avert blackouts," *Bloomberg News*, 11 February 2004. Article available at the Web site <<http://www.iht.com./articles/129081.htm>>, site last accessed 12 February 2004.

53 More recently China has been improving energy efficiency in coal plants through clean-coal technologies from abroad. See Jim Watson, Liu Xue, Geoffrey Oldham, Gordon MacKerron and Steve Thomas, "International Perspectives on Clean Coal Technology Transfer to China," final report to the Working Group on Trade and Environment, CCICED, August 2000. The report is available at the Web site <http://www.iisd.org/pdf/cctt_final_report_aug00.pdf>, site last accessed 13 February 2004.

54 Erica Downs, *China's Quest for Energy Security* (California: RAND, 2000).

the reform process, because they viewed the bank's support as crucial to attracting the necessary foreign investment.⁵⁵ However, the World Bank's position on power sector reform has not remained constant through time. Initially, the World Bank recommended full-scale privatization, with only minor government regulation that "reduces barriers to the introduction of market forces and encourages private investment in the power sector."⁵⁶ Now, although the World Bank is still promoting privatization, it is also a major advocate of establishing an independent regulatory authority—something missing from earlier reform plans.⁵⁷ The Asian Development Bank has also urged China to accelerate power sector reforms by allowing private capital into the field, and establishing "an integrated and transparent supervision mechanism." Like the World Bank, it too stresses the need "to perfect the legal environment in the power sector as soon as possible."⁵⁸

4. The California crisis and its repercussions in China

Another external pressure stems from the California electricity crisis in 2000-2001, following the "deregulation" of the power sector. There is no doubt that this crisis caught the attention of China's highest leadership. Many sources indicate that after witnessing the shortages and blackouts in California, China's leadership reconsidered the "sweeping" market reforms that were originally proposed, and switched to a more gradual restructuring.⁵⁹ As one official of the State Power Corporation stated, "California's crisis warned us that we should be very cautious when undertaking the reforms and consider all the circumstances."⁶⁰

Once its causes were better understood, the Chinese leadership took several lessons from the California crisis, as well as from subsequent highly publicized international blackouts. One was the need to invest in grid infrastructure—a task that in most countries has fallen on the government to finance, and something that may suffer if the sector is privatized. Another lesson was the recognition and fear of market power abuse, which can result in an unregulated power market that is not perfectly competitive.⁶¹ But perhaps most significantly, Chinese officials concluded from California that

55 US Consultant advising Chinese government on electricity reform, in-person interview by author, Beijing, 20 September 2003.

56 The World Bank, "China Power Sector Reform: Toward Competition and Improved Performance," report no. 12929-CHA, 15 September 1994.

57 The World Bank, "Fostering Competition in China's Power Markets," discussion paper no. 416, March 2001; The World Bank, "Establishment of a State Electricity Regulatory Commission in China: A Suggested 'Roadmap,'" working paper, October 2002.

58 "ADB Official Urges China to Permit Private Capital to Enter Power Sector," *AFX News Limited*, 19 September 2003.

59 "China Power Reforms May be Scaled Back after California Electricity Crisis," *AFX – Asia*, 24 April 2001.

60 "China: Slowdown on Power Reform," *AsiaInfo Daily China News*, 26 April 2001.

61 "Lessons to be Learned from US Blackouts," *South China Morning Post*, 12 November 2003.

the only way to maintain system reliability is to maintain government control—despite the fact that state management of the power sector has continually resulted in power shortages over the past decade.⁶² Whether or not this was an effective lesson for the Chinese government to take from the California experience remains to be seen.

5. State-owned enterprises

Finally, another significant pressure on the state in considering electricity reform is the experience of state-owned enterprise (SOE) reform. Since the beginning of economic reform, China's economy has undergone a dramatic change in ownership structure, with SOE contributions to national industrial output dropping from 75 percent in 1978 to less than 35 percent in 1995. However, SOEs still play an important role in the economy, as the largest employer of the nation's urban workforce,⁶³ as well as through their monopoly of heavy industries that provide the basic inputs for all other sectors in the economy. Perhaps most importantly, the government continues to depend on SOEs for fiscal revenue; in 1995, SOE sector production had declined to only 35 percent of China's total industrial output value, but it still provided 71 percent of the government's tax revenue.⁶⁴ Furthermore, the former Soviet Union's experience with abrupt government withdrawal from the economy suggests the need to proceed slowly.⁶⁵ For all of these reasons, the Chinese government has remained reluctant to privatize the entire SOE sector.

Though SOEs are thus unlikely to disappear completely, the sector is deeply troubled by inefficiencies and large deficits. Throughout the 1980s and 1990s, they were mostly unable to compete with non-state firms due to overstaffing, high production costs, low economies of scale and outdated product lines, as well as the "cradle-to-grave" responsibilities for their workers inherited from the command economy. One of the largest loss-makers was the state-owned coal sector, which by 1993 was receiving nearly six billion yuan in state subsidies and employed over 3.4 million workers.⁶⁶ These inefficiencies in the coal sector contributed to inefficiencies in coal-fired power generation as well, which accounted for 75 percent of China's power generation capacity in the 1990s.

As a response to the challenges of SOE reform, the Central Committee has promoted a policy of "grasping the large and releasing the small," in

62 "China Power Reforms May be Scaled Back After California Electricity Crisis," *AFX – Asia*, 24 April 2001.

63 Edward Steinfeld, *Forging Reform in China: The Fate of State-Owned Industry* (Cambridge, UK: Cambridge University Press, 1998), p. 11.

64 Steinfeld, *Forging Reform*, p. 17.

65 Barry Naughton, "The State Asset Commission: A Powerful New Government Body," *China Leadership Monitor*, Hoover Institution, Stanford University issue no. 8 (Fall 2003).

66 Elspeth Thompson, *The Chinese Coal Industry: An Economic History* (London: Routledge Curzon, 2002), pp. 217, 237.

which small- and medium-sized enterprises will be privatized, while the state retains control of around 1,000 of the largest enterprises, in a model reminiscent of the old South Korea *chaebols*.⁶⁷ In line with the centralizing tendencies of this last policy, a powerful new government body called the State-Owned Assets Supervision and Administration Commission (State Asset Commission, or SAC) was established in March 2003, in an attempt to better manage the troubled state enterprises.⁶⁸ The SAC's authority includes the petroleum, petrochemical and electricity enterprises. It is therefore likely to bring yet another political interest to the table in the electricity sector reform discussion. The head of the commission, Li Rongrong (who exemplifies the newly emerging technocratic leadership discussed below), has said that state ownership is appropriate in sectors affecting national security, sectors that have a natural monopoly, sectors that provide important public goods or services, important national resource sectors, and key enterprises in "pillar industries" and high-tech sectors.⁶⁹ Since the electricity sector potentially falls into all of these categories, Li's outlook indicates that state involvement in the electricity sector is likely to continue.

The formation of the SAC may help clarify government property rights and improve management oversight, but there is also a risk that it may become an "an overly powerful and interventionist body."⁷⁰ This risk is highlighted by the fact that the Central Committee has stressed the importance of continued Party control within SOEs, with Party committees directed to be the "nucleus" guiding SOEs into the future. The desire to maintain Communist Party control in large-scale SOEs that form the backbone of the economy grows out of the historical evolution and current nature of the Chinese party-state, to which we turn next.

The nature of the party-state after the 16th Party Congress

1. The Communist Party today

Although little else has stayed the same over the turbulent last half-century of revolution, collectivization and then reform, the CCP's essentially Leninist political organization, with its lack of tolerance for any truly autonomous social organization, has remained remarkably constant. With economic reform, the CCP has reinvented itself in order to hold on to power, by abandoning central planning and most other recognizable principles of socialism. Thus, some analysts have argued that the regime is facing a loss of legitimacy and inevitable collapse.⁷¹ Others, however, argue that the regime

67 Saich, *Governance and Politics of China*, pp. 230-234.

68 Naughton, "The State Asset Commission," p. 1.

69 Naughton, "The State Asset Commission," p. 5.

70 Naughton, "The State Asset Commission," p. 1.

71 John P. Burns, "The People's Republic of China at 50: National Political Reform," *China Quarterly* 159 (1999), pp. 580-594.

is more resilient than frequently assumed, and that the CCP is capable of adapting to external and internal changes while holding on to power.⁷² Thus far, the trajectory of power sector reform argues in favour of the latter interpretation.

Evidence of the Party's staying power includes the fact that, with 63 million members (about five percent of the population), it continues to be an elite organization, and membership is highly sought-after, if only for instrumental reasons. Reasons for joining the Party now have much more to do with access to political power and economic opportunity than with ideological commitment. Nevertheless, despite both corruption and this lack of inspiring ideology, the Party's continuing use of the *Nomenklatura* system keeps it capable of disciplining its members. The CCP retains full control over appointments to leading positions, not only in government agencies at all administrative levels, but also in the legislature, judiciary, military, media, mass organizations and strategic enterprises.⁷³ The process by which top leaders are selected also remains relatively unreformed. Despite much talk about institutionalization and standardization of top leadership in recent years, the 16th National Congress of the CCP in November 2002 suggested that factional political alignments and manoeuvring may in fact still be the norm. Although this Congress was supposed to witness the first institutionalized and orderly transfer of power from one set of leaders (Jiang Zemin, representing the "third generation") to another (Hu Jintao, head of the "fourth generation"), Jiang was able to maintain a great deal of power by stacking the Politburo Standing Committee with his associates and his power base.⁷⁴

Despite these essential continuities, there have also been many changes to the CCP, with important implications for the power sector. These include the opening of Party membership to private entrepreneurs, a shift to technocratic leadership with engineering backgrounds, a geographical bias toward the coastal areas, insider privatization, and the rise of the so-called "princelings," a term used to describe children of former (and current) top political elites. First, despite the continuing elite nature of the Party, its membership has shifted from being dominated by the peasantry to now including a much larger social base. This shift is encapsulated in Jiang Zemin's much-touted "theory" of the "three represents," which states that the CCP represents not only the working classes but also "the development demand of the advanced forces of production, the progressive direction of China's advanced culture, and the fundamental interests of the vast majority of the Chinese people."⁷⁵ This theory marks the CCP's bid to maintain legitimacy

72 Burns, "The PRC at 50," p. 580.

73 Burns, "The PRC at 50," p. 582.

74 Joseph Fewsmith, "The Sixteenth National Party Congress: The Succession That Didn't Happen," *China Quarterly* 173 (2003), pp. 1-16.

75 Fewsmith, "The Sixteenth NPC," p. 13.

by reinventing itself from the vanguard of the revolution to a new Party more broadly representing the “nation.” At the same time, the declaration also works to incorporate the forces of private business and contain them within the Party, rather than allowing them to develop into an autonomous political force. This suggests that electricity restructuring may also be a way for the Party to channel an important economic force toward its own ends, putting the capital and technology of the “advanced forces” of electricity production to work for the Party. The fact that Jiang’s theory was accompanied by a strong theme about creating a middle-class society is also important. This distinctly non-communist sounding aim suggests that provisions for the continued growth of energy consumption (as part of a “middle-class” lifestyle) are now an important mandate for the Party’s reinvention of its own image and goals.

While the process of choosing top leaders has not changed significantly, the composition and characteristics of top Party leadership have been transformed. Leaders today are far more educated than Mao, Deng and their generation of Long March revolutionaries. Another important transformation with implications for regional power sector development is the geographical origins of the leaders. Whereas many older leaders like Deng Xiaoping and Zhao Ziyang were either from, or had long experience in, the old revolutionary base of Sichuan province in the southwest, the new leaders are overwhelmingly from, or have long work experience in, the economically dynamic coastal provinces; Jiang Zemin’s power base, for example, is in Shanghai. Indeed, after the 16th Party Congress, five out of the seven provincial representatives to the Politburo are now from the coastal provinces. This eastern bias of the new leadership has contributed to the continuation in practice of the “coastal strategy” in place since the Seventh Five Year Plan (1986-1990), which calls for the coastal provinces to lead China’s entry into the global economy. Despite the launching of the “Open Up the West” campaign in 1999, intended to redress regional imbalances, the disproportionate number of leaders from the coast suggests that the resource-poor but economically dynamic east coast will continue to dominate in terms of having its interests in electricity power supply met. As Joseph Fewsmith suggests, “the east coast developmental perspective such people bring to the Politburo is likely to mesh well with the technocratic orientation of others in the leadership,” but “interior provinces are likely to find it difficult to get their voices heard at the highest level.”⁷⁶ This has clear implications for national priorities in power sector development.

⁷⁶ Fewsmith, “The Sixteenth NPC,” p. 9. This suggests an even worse position in terms of far western regions such as Tibet getting their voices heard.

2. *Technocratic leadership*

Perhaps the most striking difference between the first two “generations” of CCP leaders, and the third and fourth generations, is the transition to technocratic leadership by engineers—particularly those trained in the electric power sector. After the heated debates and purges of “experts” in favour of “reds” in the early days of the PRC, few technocrats could be found at the reins of power for a period of several decades. As late as 1985, technocrats were virtually non-existent in the posts of provincial Party secretary or governor.⁷⁷ By 1996, 12 out of the 22 members of the Party Politburo had engineering and technical college degrees,⁷⁸ and by 2000, between 50 and 75 percent of top posts in China were filled by technocrats.⁷⁹ This trend became even more pronounced after the 16th National Party Congress: four of the nine members of the Politburo Standing Committee are now graduates of China’s top engineering school, Qinghua University, and the other five are also graduates of technical schools.⁸⁰ The fact that recent top leaders disproportionately represent the field of energy and electricity suggests that electric power is not only a key economic sector, but that it also serves as a key political power base through which the factional manoeuvring of elite politics is carried out.

The career of former premier Li Peng illustrates how electrical and political power have frequently reinforced each other within the recent Chinese party-state. Li’s training in hydroelectric engineering at the Moscow Power Institute in 1948 positioned him to become one of the leading figures in the PRC’s power sector.⁸¹ He began his career in power sector administration, eventually becoming the minister of MOEP in 1983. This was followed quickly by his rise to the Politburo and the Party Secretariat in 1985, the standing committee of the Politburo in 1987, and the position of premier from 1988 to 1998. The background of the new Party general secretary, Hu Jintao, further suggests the importance of engineering culture in elite politics. Like Li Peng, Hu Jintao majored in hydroelectric engineering at Qinghua University. He served as a political counsellor there after graduation, making connections that served him well throughout his meteoric political rise. In fact, Qinghua has produced by far the highest number of fourth-generation government leaders—far ahead of the second institution, the Central Party School (and since the beginning of reform, leaders of the Central Party School have always been graduates of Qinghua).⁸²

77 Li Cheng, “Jiang Zemin’s Successors: The Rise of the Fourth Generation of Leaders in the PRC,” *China Quarterly* 161 (2000), pp. 1-40.

78 Miller, “Overlapping Transitions.”

79 Li, “Jiang Zemin’s Successors,” p. 21.

80 Fewsmith, “Sixteenth NPC,” p. 13.

81 Lieberthal and Oksenberg, *Policy Making in China*, pp. 52-3.

82 Li, “Jiang Zemin’s Successors,” p. 29. At the same time, Qinghua has also been a leading source of intellectual criticism of large-scale engineering projects such as the Three Gorges and the

Hu also worked for almost a decade at the Liujiaxia hydropower plant in Gansu.⁸³ In sum, Li, Hu and many other top leaders built their political careers through support from both structures of and individual patrons from electrical power engineering. This and other evidence of the Party's close ties to electrical power suggests that top leaders are invested in closely monitoring electric power sector restructuring, particularly insofar as it affects their own political power bases.

3. Princelings, insider privatization and corruption

Another significant development in Party leadership is the rise of the "princelings" in the Politburo and in provincial leadership. All princelings do not see eye to eye on matters of policy, but they do share some similarities, chief among which is that they "bring an elitist perspective that accords well with the east coast developmental perspective."⁸⁴ In line with the trend toward technocratic leadership, these princelings generally graduate from elite universities, particularly Qinghua, Beijing University and the Harbin Military Institute of Engineering.⁸⁵ In addition to their political rise, the princelings have also frequently become the key new business elites through insider privatization and crony capitalism. This has resulted in tremendous levels of corruption, associated not only with the massive stripping of formerly public assets but also numerous cases in which officials have sold government jobs.⁸⁶ In 2001, the Party investigated more than 175,000 of its own officials for corruption; undoubtedly, this figure does not represent the full extent of the problem.⁸⁷

The political-economic logic of electricity reform

Putting these pieces together, the political-economic logic of electricity reform can be understood as the creative response of the party-state to a set of technical and economic constraints on the one hand, and on the other, to its own dynamics of adapting to internal and external changes in ways that permit it to stay in power. Economic reforms were undertaken to help the CCP maintain its political control. This entails both the incorporation of the business elite into the Party, and the creation of a large middle class

WEETP. Engineers are not necessarily in favour of large hydropower or even in favour of the energy sector, but there is nevertheless a frequent alliance of electrical and political power through large-scale engineering projects.

83 Richard Daniel Ewing, "Hu Jintao: The Making of a Chinese General Secretary," *China Quarterly* 173 (2003), pp. 17-34.

84 Fewsmith, "The Sixteenth NPC," p. 13.

85 Li, "Jiang Zemin's successors," p. 38.

86 Burns, "The PRC at 50," p. 588.

87 According to Xinhua news agency, as reported by BBC News, 2003. The information is available at the BBC Web site, at <http://news.bbc.co.uk/1/shared/spl/hi/asia_pac/02/china_party_congress/china_ruling_party/problems_mount/html/corruption.stm>, site last accessed 6 February 2004.

that must be kept content through a growing consumption of both materials and energy. As Jing Wang has argued, the construction and popularization of leisure culture is “first and foremost an official discourse born from a well-calculated state policy.”⁸⁸ The state has not only inculcated an ideology of mass consumption, but it has also undertaken the provision of material goods needed to put the culture of consumption into effect.

Provision of these goods depends on economic growth, which in turn necessitates a large expansion in electricity generation capacity—just the type of challenge that the state’s technocratic engineering elite is inclined to accept. On the other hand, these elites, with personal experience in the engineering and management of large power systems, also realize that China is hampered not only by resource and technological constraints, but also by the lack of capital to fund the huge infrastructure investments needed. Foreign investment is a tempting solution to this need, particularly given simultaneous financial squeezes from SOE reform, and pressure from consultants and lending institutions such as the World Bank. At the same time, however, the CCP has geopolitical concerns, stretching deep into its own history, about relinquishing control to foreign investors—or, for that matter, to other domestic social forces. The trajectory and results of electricity sector reform are thus products of careful negotiation within these objectives and constraints. The next section builds upon this analysis to examine the implications of this logic on four salient topics that have emerged in current policy agendas. Each of the four poses a challenge to successful electricity reform and social stability.

The politics of contemporary challenges

Recurring cycles of over- and undercapacity

For decades, the central planning of electricity in China required detailed projections of national demand over five-year periods, the allocation of funds to meet projected needs through new generation capacity, and the balancing of supply and demand at national, regional and even local levels (because of transmission limitations). Major flaws in this model became apparent in the early 1980s, when national electricity demand increased rapidly, leaving the central government unable to adjust supply in time. The result was an electricity shortage throughout the country that lasted for years and created a “bottleneck on economic development.”⁸⁹ Reforms that began in 1985 to open up the power generation sector to non-central government investors and to encourage local governments to raise their own money to build new

88 Jing Wang, “Culture as Leisure and Culture as Capital,” *Positions* 9 (1), pp. 73.

89 Chi Zhang, Michael M. May and Thomas C. Heller, “Impact on Global Warming of Development and Structural Changes in the Electricity Sector of Guangdong Province, China,” *Energy Policy* 29 (2001), pp. 179-203.

generating capacity were supposed to help ease the constraints of central planning. However, the 10th Five-Year Plan (2000-2005), which was formulated during a downturn in demand due to the 1997-1998 Asian financial crisis, severely underestimated national energy needs during what has turned out to be a period of rapid economic growth.⁹⁰

The summer of 2003 left China with an estimated supply gap of about 10,000 MW of capacity; this deficit is expected to reach 15,000 MW in 2004.⁹¹ Together with difficulties in balancing regional supply and demand, the 2003 gap resulted in shortages across 14 provinces and blackouts in 18 of the country's 31 provinces.⁹² In Shanghai, more than 1,000 businesses, including major international joint ventures such as General Motors and Volkswagen, were ordered to halt their operations during periods of especially high temperatures and peak electricity usage.⁹³ The power shortages suffered by Guangdong province in the booming Pearl River Delta region are of serious concern to existing companies and to potential foreign investors. According to one source, "power shortages are one of Guangdong's dirtiest—and best kept—secrets. Companies struggling with the issue will not talk about it on the record, and provincial power officials will not discuss it at all for fear of scaring away potential investment."⁹⁴ An estimated 10 percent of Guangdong-based factories, as well as some golf courses and luxury villa developments, have installed their own on-site backup power generation, often at extremely high economic and environmental costs.⁹⁵ Attuned as it is to the threat that economic disruption and social instability pose to its continued existence, the party-state has a keen interest in preventing this electrical reliability problem from persisting or becoming worse.

As a result, China faces the challenge of reconciling electricity shortages in parts of the country experiencing rapid economic growth with economic losses in areas suffering from stagnation and excess power generation capacity. The obvious solution of large-scale regional power transmission is limited by an aging, inefficient and often not interconnected electricity grid infrastructure. For years, the government has announced plans to integrate the country's regional electricity grids, in order to facilitate transfer from the west to the east. However, there are many remaining difficulties in the face of current plans to establish six regional power markets and two private grid companies. Privatizing the grid companies means that several separate

90 "Hither and Thither; Learning from California," *BusinessWorld*, 25 May 2001.

91 "Mainland Power Shortage to Worsen," *South China Morning Post*, 20 June 2003.

92 David Wilder, "Power Reforms Offer Little Comfort as China Faces Cold Winter," *FOCUS AFX – Asia*, 10 December 2003.

93 "Shanghai Firms to Stop Work in Peak Hours to Save Power," *South China Morning Post*, 9 September 2003.

94 "Power Shortage Hobbles Delta's Industrial Machine; Investors Say the Problem May Damage Guangdong's Ability to Attract Capital," *South China Morning Post*, 29 January 2003.

95 "Power Shortage Hobbles Delta's Industrial Machine," *South China Morning Post*, 29 January 2003.

companies will not only have to pool their resources and work together—they must also decide that such investment and cooperation is in their best interest. Given both the unlikelihood of such decisions as well as the party-state's strategic interest in electricity development, it is logical to predict that the state will eventually have to fund national grid unification.⁹⁶ This is particularly true for those plans which call for the national electric grid, with interconnected regional networks, to be in operation by 2010, as well as plans calling for an "electric grid with the Three Gorges electrical system at the core supported by both strong regional and inter-regional grids" to be in place by 2020.⁹⁷ The fact that the government persists in promoting the building of a national grid, despite the technical and financial barriers to such an undertaking, may also indicate that it is trying to create the need for state involvement in the power sector during a time when its role is gradually being diminished.

Price distortions and market manipulation

Implementation of the six proposed regional competitive power markets (figure 2) will not be China's first experimentation with competition in power provision. Competition in the electricity industry began on a limited, experimental basis in 1999, in an effort to address the sudden turnaround of the power market from chronic shortage to widespread surplus after the Asian Financial Crisis hit in 1997.⁹⁸ The State Power Corporation of China (SPCC) selected six provinces (three in the northeast and three in the east) to experiment with competitive power markets along the lines of the UK power pool model. However, the experiment was short-lived, both because electricity demand increased again in 2001, and because of uncompetitive and monopolistic practices stemming from the SPCC's political power. This failure likely contributed directly to the decision to break up the SPCC through further reform.⁹⁹

Missing from plans for further reform is the removal of electricity price-setting authority from state control. Prices are currently determined by the Energy Bureau of the National Development and Reform Commission (NDRC), which also sets prices for other energy resources, including coal. Historically, prices were distorted by government guarantees on sales for almost every power plant and generator, ensuring profits for power companies.¹⁰⁰ Inefficiencies within the current tariff system include the lack of provisions for merit order, and the fact that power generators have no

96 "State Power Reform Role Up in Air," *Business Daily Update*, 4 June 2001; "State Power Outlined Reform Blueprint," *AsiaInfo Daily China News*, 6 June 2001.

97 "Xinhua: China's Future National Power Grid Outlined," *Financial Times Information*, 10 September 2003.

98 Zhang, "Reform," p. 21.

99 Zhang, "Reform," p. 21.

100 "Hither and Thither; Learning from California," *BusinessWorld*, 25 May 2001.

incentive to reduce costs. There is also considerable price discrimination among consumer categories.

Plans to create competitive power pools and private companies will at some point require that price controls be lifted, resulting in stranded costs.¹⁰¹ This presents the worrisome scenario to the state that a true market price for electricity would cause prices to rise sharply,¹⁰² perhaps sparking unrest or instability. The price gouging that occurred in California most certainly caught the attention of anxious Chinese officials already wary of relinquishing the authority to control power prices. Nevertheless, the government has recently unveiled a new two-tier pricing mechanism for electricity pricing, which moves toward market-determined prices by incorporating both fixed and variable costs of power generation. The government is responsible for setting average price related to fixed costs, while market forces will set the price reflecting variable costs.¹⁰³ Although this tariff structure could be viewed as an intermediate step towards transitioning to market-determined power prices, it may also represent an attempt to appease market champions while maintaining control over this crucial sector.

Old elite, new titles

Another persistent characteristic of the Chinese power sector is the frequent conjuncture of insider privatization, corruption and control by elite families. That these forces affect the outcomes of power sector reform is clear from both the case of the short-lived (1997-2002) State Power Corporation of China (SPCC) and the creation of the State Electricity Regulatory Commission (SERC) that followed. As discussed above, the energy sector was an important power base for Li Peng throughout his career, and even after he stepped down from the premiership in 1998, his power base persisted within the SPCC, where his “princeling” son, Li Xiaopeng, was deputy general manager. When the SPCC was dismantled into five new Independent Power Producers (IPPs), Li Xiaopeng became head of the Huaneng Corporation, the largest of the five.¹⁰⁴ At the same time, Li Peng’s daughter, Li Xiaolin, was named vice president of China Power Investment Corporation—bringing into serious question the “independence” of the new IPPs.¹⁰⁵ A further wrinkle concerning the fate of the SPCC is the fact that its

101 “Hither and Thither; Learning from California,” *BusinessWorld*, 25 May 2001.

102 “Asia Power Sector to see Further Liberalization in Next Few Years,” *AFX – Asia*, 15 May 2001.

103 “China Expected to Launch Two-Tier Power Pricing System—Report,” *Xinhua Financial News*, 8 October 2003.

104 In December 2003, Huaneng became a major player overseas with its purchase of an Australian energy firm—the first time a Chinese firm had done this in the electricity sector. “China acquires power company in Australia,” *People’s Daily* online article, posted 16 December 2003, available at the Web site <http://english.peopledaily.com.cn/200312/16/eng20031216_130541.shtml>, site last accessed 21 July 2004.

105 “Li Peng’s Daughter in Top Power Post,” *South China Morning Post*, 30 December 2002; Timothy Oakes, “Building a Southern Dynamo: Guizhou and State Power,” *The China Quarterly* 178 (June 2004, in press).

former head, Gao Yan—a protégé of Li Peng and a member of the CCP Central Committee, who held the rank of a government minister—fled from China in September 2002 after being arrested, while facing investigation for corruption while he was governor of Yunnan.¹⁰⁶ The fact that Gao was investigated despite his high position suggests that he was a “sacrificial lamb” to the 16th Party Congress, given up to ensure that Li Peng’s family maintained control over state power.¹⁰⁷ Such ‘all in the family’ management has also led some industry consultants to argue that the state in fact has little interest in commercializing the power sector because of the lack of interest shown by overseas investors, and that in fact “the break-up was perhaps motivated as much by the negative image of monopolies ... as it was by an effort to enhance industry performance or introduce greater accountability.”¹⁰⁸

The current status of the SERC supports this view. Established after the break-up of the SPCC in December 2002 to serve as an independent regulatory body for the newly restructured power sector,¹⁰⁹ its ‘independence’ too is questionable due to the fact that it is led by Chai Songyue, long-time supporter of Li Peng. Despite being called a “ministerial-level industry watchdog” whose founding is a “major breakthrough for the sector,”¹¹⁰ its industry and political ties—and the fact that its small staff is composed of engineers lacking economic training—seriously affect the SERC’s ability to fulfill its mandate of regulating complex markets, preventing market power manipulation, and arbitrating industry disputes.¹¹¹ It is comprised of many ex-SPCC employees, despite the fact that it is supposed to independently regulate the newly privatized power companies, many of which are also staffed by ex-SPCC employees. Furthermore, while its small staff size and expansive mandate already place limits on the SERC’s productivity, the NDRC has also maintained control of what really matters even in a reformed power sector—electricity prices and the siting of new generation capacity. The SERC’s effectiveness as a regulator remains to be seen, but it will certainly be subject to the logic and limitations of old elite power bases.¹¹²

106 “State Power Set for Changes at Top After Arrest,” *The Standard*, 22 October 2002; *World Sources, Inc., Hong Kong Imaail, Emerging Markets Datafile*, Available from LexisNexis.

107 Another energy executive, Lao Derong, the chairwoman of the Shenzhen Energy group, also disappeared in October 2002. See Eric Eckholm, “Chinese Power Company Chief Flees the Country and Scrutiny,” *New York Times*, October 20, 2002, section 1, p. 8. In April 2003, some 1,300 government auditors were assigned to examine the 2002 financial report of the SPCC as well as its top executives’ “economic responsibilities,” constituting one of the largest audits in recent years. “Beijing Orders Probe of State Power’s Records,” *The Straits Times*, Singapore, 5 April 2003.

108 Oakes, “Building a Southern Dynamo.”

109 Eric Ng, “Watchdog to Take Over Key Power Regulators,” *South China Morning Post*, 17 January 2002.

110 “Power Monopoly Broken down, Electricity Regulatory Commission to Set up,” *China Daily*, 30 December 2002.

111 Qinghua University professor, in-person interview by author, Beijing, 5 November 2003.

112 Elaine Chan, “Power Sector Shakeup Likely to Benefit Huaneng,” *Financial Times Information Network - The Standard*, 18 October 2002.

Regional inequality and resource transfers

The last problem we address is regional inequities in both economic development and electricity supply and demand. Three major long-term projects are planned to address balance in regional supply and demand: nationwide power grid interconnections; north-south power transactions; and west-east power transmission.¹¹³ These ambitions have been encapsulated into a single, frequently-promoted slogan—"the whole country is connected by one grid; western electricity sent east; north and south electricity sent to each other"—suggesting a high-level and long-term plan for the power sector reform. These plans have historical resonances and antecedents which have important implications for our understanding of state interests in strategic control over the power sector.

The plan for national grid unification has already been discussed above. Here, it is useful to add that even while the decentralized, small-scale electricity production encouraged during the Maoist era led to the construction of thousands of unconnected small grids, the connection of larger electric power grids has also served as a key element of inter-regional cooperation and development since the mid-1950s. During periods in which China's political climate stressed the build-up of regional systems, the first and most fundamental method was through the creation of infrastructure for inter-provincial power use, transportation and coal mining. Regional power grids often served as a precondition for other types of regional industrial cooperation.¹¹⁴ Thus, in addition to the technical and economic incentives for national grid unification, it is also viewed as an important building block of national political unity and control.

Regional supply and demand is also addressed by the West-East Electricity Transfer Project (WEETP), which is associated with the much-touted Open Up the West programme. The latter includes plans to construct new infrastructure, strengthen environmental protection, readjust industrial structure, and promote development of science, technology and education in the west. More specific priorities include the WEETP, significantly extending the road network, and developing hydropower.¹¹⁵

1. Early regional development strategies and the Third Front

When the CCP came to power in 1949, it inherited a situation of severe regional inequality, in which almost all industries were concentrated in the northeast and a few large coastal cities. From 1949 until 1978, development policy was largely driven by the ideological goal of local self-reliance and by

113 Eric Ng, "State Grid Crop Sets China Power Strategy," *South China Morning Post*, 27 March 2003.

114 Dorothy Solinger, "The Shadowy Second Stage of China's Ten-Year Plan: Building Up Regional Systems, 1976-1985," *Pacific Affairs* 52:2 (Summer 1979), pp. 241-264.

115 "Eastern China to Tap Electricity from Western Region," *Xinhua News Agency*, 12 April 2000.

geopolitical concern about the vulnerability of the eastern coast. As a result, the policy leaned strongly toward the development of heavy industries in the interior. Of particular note was the massive programme of “Third Front” investment (1964-1971) to create a self-sufficient industrial base within remote and strategically secure areas in the interior, particularly in Sichuan and Guizhou provinces, as a safeguard against the chance of protracted war with the Soviet Union or the US.¹¹⁶ At its peak, some two-thirds of the state’s industrial budget was spent on Third Front defence industrialization, which included about 29,000 state enterprises with a workforce of 16 million. Basically all economic objectives except for petroleum exploration were subordinated to the completion of the Third Front.¹¹⁷ This included massive spending on centralized energy and electricity infrastructure for coal mining and power transmission.

Rather than aiding economic development, however, the exorbitantly costly Third Front had a negative impact that Naughton suggests far exceeded even the disruption of the Cultural Revolution.¹¹⁸ Very few of the projects developed backward or forward linkages with the local agricultural economies, or improved local standards of living.¹¹⁹ Nor did the effort actually enhance regional self-sufficiency because the project was in fact highly centralized; local governments had very little input into how Third Front funds could be used.¹²⁰ Thus, the Party’s focus on interior regions at the expense of the more developed coast appears to have been more related to defence requirements and pragmatism than to a policy of regional equity *per se*.

In 1978, national policy shifted to one of comparative advantage, or the “ladder theory,” in which the eastern (coastal), central and western regions were likened to steps on a ladder. The coast was meant to use its advantages to entice foreign investment and get rich first, with advantages diffusing slowly westward later. This was made very explicit in the Seventh Five Year plan (1986-90), according to which investment priorities for the rest of the twentieth century would be focused on the coast; the central region would be allocated investments of energy and raw materials for support of coastal development, and western development would simply be postponed.¹²¹ This

116 Barry Naughton, “The Third Front,” *China Quarterly* 155 (1988), pp. 351-86.

117 Naughton, “Third Front,” pp. 366-67.

118 Naughton, “Third Front,” p. 351.

119 Tim Oakes, “Selling Guizhou: Cultural Development in an Era of Marketisation,” in Hans Hendrischke and Feng Chongji, eds., *The Political Economy of China’s Provinces: Comparative and Competitive Advantage* (New York: Routledge, 1999), pp. 31-72.

120 Naughton, “Third Front”; Oakes, “Selling Guizhou.”

121 The eastern (coastal) region included Liaoning, Beijing, Tianjin, Hebei, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, Guangxi and Hainan. The central region encompassed Inner Mongolia, Shanxi, Henan, Anhui, Hubei, Hunan and Jiangxi; and the western region included the rest of the country. Shaoguang Wang and Angang Hu, *The Political Economy of Uneven Development: The Case of China* (New York: M.E. Sharpe, 1999), p. 179; Yehua Dennis Wei, *Regional Development in China: States, Globalization and Inequality* (New York: Routledge, 2000), p. 11.

left Third Front regions not only waiting indefinitely for development, but also saddled them with huge sunk costs and failing SOEs.

2. Open Up the West and the WEETP

Growing inter-provincial disparity led to the 1999 introduction of Open Up the West, to “create conditions for gradually narrowing down regional gaps,” redress regional economic imbalances and let the west “catch up.”¹²² However, Open Up the West is unlikely to be effective in its mandate for two major reasons. First, increased fiscal decentralization has led to a serious decline in the centre’s ability to address regional economic disparity by redistributing funds between provinces. Second, most of the programmes that have been proposed under Open Up the West further exacerbate disparities between the west and east.

A prime example of this is the WEETP, which will transfer electricity generated in the resource-rich west to the electricity-starved east. In particular, Guizhou province is to build four coal-fired power plants and four hydro-power plants in two years, all to supply Guangdong.¹²³ However, the campaign-style slogans and mega-project approach that the centre has used to “sell” the WEETP has not endeared it to most people in Guizhou. Timothy Oakes (2004) cites a Guizhou scholar as commenting, “Western electricity sent east merely exports the east’s pollution to Guizhou; in exchange, Guizhou gets a low price for its electricity and the east gets to make the manufactured goods that Guizhou people buy at high prices.”¹²⁴ Guizhou officials and residents alike are well aware of their province’s long history of marginalization (including the lingering effects of the Third Front) and believe that the attempt to make them generate cheap and dirty power for Guangdong will not only produce much unnecessary pollution, but also further solidify long-standing patterns of resource extraction and internal colonialism.¹²⁵ More broadly, the WEETP encapsulates the essence of China’s current electricity sector reform, which so far has not resulted in either control or benefits devolving to the poor or powerless; the party-state’s control over electricity production persists, for the sake of economic growth for the middle class and, ultimately, to help ensure the Communist Party’s hold on political power.

Conclusions

This analysis of China’s electricity sector reform suggests that neither state capacity nor the party-state’s ability to exert discipline in the areas that its

122 Wang and Hu, *The Political Economy of Uneven Development*, p. 182.

123 “Guangdong to be powered by electricity from West China,” *People’s Daily*, 26 November 2001.

124 Oakes, “Building a Southern Dynamo.”

125 Oakes, “Building a Southern Dynamo”; Oakes, “Selling Guizhou.”

top leaders choose as priorities have decreased. Thus, rather than interpret power sector reform and China's apparent embrace of competitive market models as either completely anomalous or as a harbinger of China's wholesale adoption of free markets and democracy, we have argued instead for an examination of the reforms as a creative, dynamic response to a set of technical and economic constraints on the one hand, and the political imperative to stay in power on the other. This logic of reform motivates the strategic decision to increase electricity production in order to meet current demand and fuel future economic growth. Such growth, in turn, is part of a larger effort by the party-state to maintain legitimacy by channelling potential citizenship demands into consumption and thus pacifying newly middle-class consumers. However, growth can only be achieved by finding ways to overcome current technical challenges in the electric power sector, some of which are themselves rooted in the PRC's earlier development strategies, including the Great Leap Forward and the Third Front, and by dealing with the growing imbalances and disparities resulting from fiscal problems brought on by the decentralization of economic decision making. At the same time, the party-state must navigate through changing international trends, foreign 'expert' advice, and much-publicized reform failures, such as the California energy crisis.

However, not everything is working out according to the party-state's plan to maintain control while also reaping the fruits of partial reform. Unintended consequences are inevitable. These include the propensity for corruption (highlighted by the case of Gao Yan), a result of the close involvement of powerful officials and their offspring in the electric power sector. This corruption also serves to delegitimize the party-state in the eyes of the Chinese public. Other consequences include growing regional inequality and environmental problems stemming from both coal combustion and large-scale hydropower projects. Although not wholly unintended, the possible challenges to state legitimacy arising from these effects may be greater than Party reformers anticipated. Indeed, the consequences of the CCP's plans for power sector reform are likely to exacerbate all of the big-picture challenges facing the CCP in this new century, particularly those related to the environment, corruption and the need for serious political reform. While current reforms do indeed keep the party-state in power, they also tie its legitimacy (and longevity) ever more heavily to the imperative of delivering economic goods. Party-state legitimacy may thus become increasingly sensitive to seemingly mundane technical questions of adequate electricity supply. In sum, through an analysis of the historical context, institutional structure and political-economic drivers of reform, we have argued that there is far more at stake than the implementation of a standard set of technical criteria, or simply "getting the prices right." While the politics of economic reform affect the specific trajectory of the electricity reform process, the power sector is also important enough—as a key input

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into the growing economy, and as a subject in which the technocratic elite leaders have personal interests—to influence the larger course of China's future.

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