China's Energy Sector: Development, Structure and Future

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Providing the energy to power China's economic boom is a daunting task that the government and industry must address. In the first of a series of articles looking at the PRC energy sector, the authors discuss the history of China's energy policies and the development challenges facing China.

The energy challenge in China is formidable. The country's demand for energy grew by nearly 20% in 2002, and China now comprises more than 10% of total world energy consumption. China is the second largest consumer of energy in the world after the United States, having recently eclipsed Japan. At the same time, China is the world's second largest source of carbon dioxide emissions, which is largely due to its reliance on coal for nearly 70% of its total primary energy supply. As China's energy demand grows, its indigenous supplies of energy are falling behind. The country has been a net importer of oil since 1993. Various sources suggest that, by 2020, China will need to import up to 70% of its crude oil requirements and 50% of its natural gas. The challenge is clear: China must find additional, clean sources of energy, whether from indigenous sources or overseas, to satisfy its rapidly increasing demand. In addition to the resources challenge, legal and regulatory challenges must be met.

Here we will examine the development of China's energy programme, including China's current energy policy and strategy, by reviewing the energy provisions of China's successive five-year plans and other significant policy developments. Future articles will examine the practical implementation of these plans, including the role of China's institutional players (regulators and national oil companies alike) in fulfilling the country's energy policy and strategy; the legal framework for foreign investment in the energy sector, including the various legal structures for participation; and the impact of the WTO on China's energy sector.

THE EVOLUTION OF CHINA'S ENERGY POLICY

Since the founding of the PRC, the energy sector has played an important role in the overall economic development of China. Prior to 1978, self-reliance was the main goal of economic policymaking, but resulted in uncoordinated and imbalanced development. Since 1978, China has sought foreign capital and entered into joint ventures to modernize and expand energy production and output in order to fuel the social and economic reforms that have marked the modern period. Recently, national oil companies were given the mission of locating additional energy resources overseas to satisfy China's growing demand, and now face challenges in fulfilling these expansion plans. With this overall change in approach, once-precluded foreign players now have new opportunities in China's energy sector.

THE EARLY YEARS OF THE PRC

After the Chinese Communist Party (CCP) assumed leadership of the country, the new government proceeded to govern China based on the "Common Programme" adopted by the Chinese People's Political Consultative Conference in September 1949. A major goal of the Common Programme was the gradual rehabilitation and return of industrial production to pre-war levels. The Common Programme recognized the importance of permitting private enterprises to continue to operate under strict scrutiny, despite a strong ideological inclination towards public ownership of production services. Industrial and energy output improved considerably during the three years that Common Programme principles were followed. The economy recovered to a level that permitted the party leadership to embark on more aggressive industrialization programmes.[1]

The Early Five-Year Plans

The government chose the Soviet-Stalinist model of development as the means to structure further reform over other viable alternatives, the most notable being the Japanese model. The reasons for this included the CCP leadership's rejection of a market-based economy and their recognition of the value of Soviet aid as being the only practical source of assistance following the Korean War trade embargoes.[2]

The first five-year plan was put in place in 1953 and officially adopted in 1955. A theme that would resonate in subsequent five-year plans was an emphasis on the development of heavy industries, including energy. The output of the steel, coal and petroleum industries increased as a result of the growth in production capacity.[3] During the first five-year plan period, greater success was achieved in exploration and prospecting, where the use of

mechanical core drilling became more common.[4] But the first five-year period was also supported by Soviet aid, and it is arguable that without this aid China would not have experienced such progress.[5]

The second five-year plan was adopted in September 1956, but was set aside in 1958 for the Great Leap Forward. The Great Leap Forward was enormously disruptive for much of the energy sector. The coal industry, the predominant source of energy, was particularly hard hit. Crude oil output was an exception to the general economic disorder, and grew thanks to the discovery of the Daqing field. The damage caused by the Great Leap Forward was exacerbated in 1960 when, following growing tensions between the two countries, Sino-Soviet relations cooled. Without Soviet help, China hardened its self-reliant attitude and went on to develop its economy and energy resources on its own.[6]

Recognizing the harm done to the energy sector by the Great Leap Forward and the loss of Soviet aid, in January 1961 the CCP Central Committee formulated guidelines for recovery.[7] They included objectives for developing new energy reserves. By 1965, China had become basically self-sufficient in oil due to the Daqing field. The coal industry, however, struggled to recover from the effects of the Great Leap Forward.[8]

Development and execution of the third and fourth five-year plans (1966-1970 and 1971-1975) were hampered by the Cultural Revolution, which began in 1966. The coal industry was hard hit once again. Chairman Mao Zedong's energy policy abandoned the better northern coal reserves and ordered exploration efforts in the south and east, which proved unsuccessful and resulted in a drop in productivity.[9] Reduced coal output resulted in an energy deficiency that hampered production in other industries such as steel.[10] The fact that oil production fared relatively well during this period was attributable to improved production at Daqing and the development of the Shengli oilfield. Oil production was no doubt the beneficiary of the slogan of the day that the "industrial sector shall learn from Daqing".

Although the Cultural Revolution continued through the fourth five-year plan, by 1971 Mao turned over responsibility for revitalizing the economy to Zhou Enlai. The Four Modernizations Policy and the Open Door Policy emerged. The importation of US technology became possible following President Richard Nixon's visit to China in 1972, and trade with western nations increased considerably.[11] Yet, isolationist tendencies continued to prevail, with only scattered efforts to seek or consider participation in industrial or minerals-related foreign joint ventures.[12]

Following the deaths of Zhou and Mao in 1976, Hua Guofeng, Mao's designated successor, announced an ambitious ten-year development plan. Many projects were started, with some directly affecting the energy sector. Crude oil exports were seen as the means to finance the massive investments and foreign technology imports required under the ten-year plan. But the drastic expansion anticipated in the oil industry was based on unrealistic expectations, which included claims that China would have 10 more Daqing-class oilfields by 2000.[13] Due to a lack of capital, advanced technology and materials, many projects under the ten-year plan were abandoned. By 1978 Deng, who regarded the plan as impractical, had become China's leader. The plan was officially abandoned in late 1979 to make way for a three-year adjustment plan (1979-81).[14]

The Untapped Energy Sector

Despite broad efforts to develop heavy industries and the energy sector over three decades, the results were disappointing. While the Soviet-style model of development had emphasized heavy industries, which included the energy sector, energy was still in short supply. The Daqing oilfield once held the promise of self-sufficiency; indeed, this field satisfied China's oil requirements for many years. But ever-growing demand was quickly catching up with domestic supply and the export of Daqing oil was beginning to take its toll by the beginning of the 1980s reform period.

Available energy also was not used efficiently. Energy consumed per unit of production (e.g., in steel production) was relatively high.[15] China officially admitted that it was consuming more energy on a per unit GDP basis than other developing countries.[16] It was also reported that, in the early 1980s, 20% or more of China's industrial capacity was idle for lack of electrical power.[17] Factories in southern China were often forced to stop operation because of energy shortages.[18] But, China's industrialization efforts had from the beginning been plagued by a mismatch of production basins and demand markets for energy. Transportation bottlenecks and an incomplete distribution network exacerbated the problem. Harnessing the abundant water resources in the upper Yellow and Yangtze Rivers also was problematic.

Problems associated with the subjective nature of planning also contributed to the predicament. The five-year plans had been good for short-term energy goals and needs, but lacked a sound long-term strategy. Under a centrally planned command economy, the government and state enterprises had effectively nationalized and monopolized the entire energy sector. But, without market competition, the state entities had no incentive to improve quality and efficiency. The government tried to better coordinate the energy industries by periodically merging and splitting relevant ministries, but did not fundamentally cure the flaw of day-to-day bureaucratic control over energy production.

The self-reliant approach, particularly since the withdrawal of Soviet assistance from China, also meant that there had been no significant foreign participation in the energy sector. Prior to the 1980s, foreign, non-Soviet participation in China's energy development was virtually non-existent. There were some imports of foreign equipment and technology in the late 1970s, but the impact was scattered. Overall, China was not integrated into the international energy market.

THE BEGINNINGS OF TRUE REFORM

Introduction of Market Improvements

Reforms beginning in the 1980s brought a slow but discernible introduction of market forces into the energy sector. China began to open the sector to foreign participation and to allow the import of technology and capital.

The new policy of opening to foreign participation and moving towards market-based reform was manifested in the sixth five-year plan, which was adopted in December 1982. The energy sector received high priority in this plan. The plan targeted development or expansion of major coal-mining areas in Shanxi, Hebei, Dongbei and eastern Inner Mongolia, Shandong, Anhui, and in south-central, south-west and north-west China. In the oil industry, development efforts were to be concentrated on the traditional oilfields in the north-east and exploration was to be encouraged in the north-west basins. Moreover, the sixth five-year plan sought active foreign participation in China's offshore exploration programme. Thus in 1982, China officially opened the South China Sea to foreign participation (subsequently expanding into the East China Sea, including Bohai Bay, in 1992). In 1985, Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi, Yunnan and Zhejiang were opened to exploration by foreigners as part of the political effort to boost oil exploration.[19]

The seventh five-year plan (1986 to 1990) promised greater market reform and opening to foreign participation, but such policies were ultimately foiled because of political events and an austerity programme that reasserted state control over an over-heated economy. Large quantities of oil were exported during this period, generating as much as one-quarter of China's foreign exchange during that time. Despite the emphasis on oil exports, no priority was given to accelerating exploration for oil. Rather, the policy under the seventh five-year plan was to renovate with new technology and expand facilities at existing oilfields, such as Daqing. Likewise in coal, the priority was not on new coal resources but on transforming and improving the efficiency of existing coal mines, many of which had low levels of mechanization. In recognition of the need for new energy supplies, and wanting to correct the perceived over-emphasis on oil development, China accelerated plans for exploration and production of natural gas during this period.[20]

Price reform was also introduced in the energy sector. Prior to the reforms, energy prices were set by the central government at low levels, requiring large subsidies to the various energy industries. Price reform took the form of a two-tier (sometimes multi-tier) pricing structure, and were introduced to the oil (1981), coal (1982), electricity (1985) and gas (1987) industries. Production output above assigned quotas could be sold at higher prices. At first, the prices were restricted to narrow bands around plan prices, but later were allowed to float. The intention was to improve profitability and to expedite the development of energy resources. But because price reforms were usually partial in nature, the actual effects were skewed. One example was in the oil sector, where price differentials for upstream and downstream products led to over-expansion of refineries at the expense of exploration and production.[21]

A New Era of Rule by Laws and Regulations

The *Equity Joint Venture Law* in 1979 was the first significant law creating an investment framework for foreign direct investment in China. This was followed by a number of laws and rules with general application to foreign direct investment and foreign-invested business vehicles, such as the *Wholly Foreign-owned Enterprises Law* in 1986, the *Sino-foreign Cooperative Joint Venture Law* in 1988 and the *Foreign Investment Industrial Guidance Catalogue* (the first of which was issued in 1995). Against this backdrop, laws specifically governing various sectors of the energy industry were also adopted. In the oil and gas sector, the *PRC Exploitation of Offshore Oil Resources in Cooperation with Foreign Parties Regulations* (1982) and the *PRC Exploitation of Onshore Oil Resources in Cooperation with Foreign Parties Regulations* (1993) were enacted, along with various other regulations and measures governing royalties and imports. The *PRC Mineral Resources Law* was revised in 1996 and governed the mining industry except for coal, which was governed by the *PRC Coal Law* (also enacted in 1996). Power was governed by the *PRC Electric Power Law* (1995).

These laws placed restrictions and conditions on foreign participation, and reflected the government's cautious stance on foreign trade and economic activities in China's energy sector. The Ministry of Foreign Economic Relations and Trade (MOFERT) was formed in 1982 to regulate foreign economic activities. Later, it was renamed the Ministry of Foreign Economic Trade and Cooperation (MOFTEC). The regulation of foreign and domestic trade has recently been consolidated under the Ministry of Commerce (MOFCOM), with MOFCOM's Foreign Investment Administration of the Ministry of Commerce becoming the chief regulator of foreign economic activities.

The National Energy Companies

The process of separating China's energy production and distribution from government administration began in 1982. The oil industry was the first sector to undertake this transformation. Further changes in the oil and other energy industries, designed to facilitate foreign direct investment and joint ventures, and to increase competition among the national companies to improve efficiency, followed between 1985 and 1988. The various Chinese national energy companies effectively became "contractors" of the central government. They were authorized to make decisions on production management, personnel changes and salary and bonus shares for employees, but were still subject to oversight by governmental organs. Under this new system of contracting, the energy companies could sell output in excess of assigned quotas in the open market. Differentials in pricing became a strong incentive for the national energy companies to increase output, but not necessarily to improve efficiency.[22]

By 1998, the oil and gas sector went through another round of restructuring. In particular, China National Petroleum Corporation (CNPC) and China National Petroleum and Chemical Corporation (Sinopec) were directed to pursue integration of upstream and downstream operations by way of asset swaps along regional lines. For instance, CNPC and Sinopec exchanged upstream and downstream assets along regional lines to render CNPC an integrated oil company in north and west China and to cause Sinopec to have integrated operations in south and east China.[23] Integration was intended to have the benefit, among others, of positioning the national oil companies to be more competitive once China acceded to the WTO. In addition, each of the three national oil companies created subsidiaries that made public equity offerings during this period.[24]

Central Planning's Shrinking Role

Several rounds of government reform occurred after the reforms of the 1980s had begun. Some of the changes directly affected the energy sector, while others were more general in nature. The reforms generally tended to reduce the role of central planning, separating policymaking and regulation from commercial operation and increase market operations. Various changes announced at the Tenth National People's Congress in March 2003 signalled a further move away from central planning. For example, the functions of the State Economic and Trade Commission (SETC) and the State Development and Planning Commission (SDPC) were combined to become today's National Development and Reform Commission (NDRC). By virtue of its role in formulating strategy for utilizing foreign direct investment within China and coordinating China's investments overseas,[25] the NDRC will be an influential force in shaping the investment regime for foreign investors in the domestic energy sector as well as for establishing policy for China's oil and gas ventures abroad.

CHINA'S ENERGY PLAN TODAY

The period following adoption of the eighth five-year plan (1991-1995) saw the second wave of reform following Deng Xiaoping's historic visit to Shenzhen. Deng announced the need for substantial business development and increased foreign investment in China. Thereafter, China's leadership accelerated energy sector reform. The need to increase production while achieving substantial energy savings became ever more acute. Energy conservation was emphasized. More effort was made to stabilize production growth in the east China oil fields while developing new oil fields in the west.

By the ninth five-year plan period (1996-2000), energy conservation had become a primary concern. As a result, in the power generation sector, the ninth plan emphasized large-scale "clean" power plants. The ninth plan period also resulted in more market-oriented management, including price reforms such as continuing the liberalization of coal prices and allowing oil prices to meet those in the international market.

The current five-year plan (2001-2005) continues to plan for the diversification of China's energy infrastructure, but with an emphasis on oil and gas. While acknowledging that coal will remain China's dominant fuel type for the foreseeable future, the tenth plan advances oil to a place of "strategic importance". The importance of natural gas is also recognized, and plans for pipelines and liquefied natural gas (LNG) import terminal facilities are included. Overall, the tenth plan indicates that China must accelerate domestic exploration and production, and make effective use of overseas resources. Against these affirmative policies, however, the 2001-2005 plan emphasizes the need to balance exploration and development by energy conservation, with conservation to take precedence, and acknowledges the need to resolve the growing conflict between energy development and sustainable development.

Despite the elevation of oil as a strategic goal and natural gas as a priority, electrical power reform will continue. The tenth plan continues to promote the development and reform of electricity generation, including power plants near coal mines (coal by wire), and seeks to reduce the number of small plants. Most notable is the current plan's emphasis on improving China's electrical transmission network to exploit the added generation capacity. The plan also proposes an increase in the proportion of hydroelectric and nuclear power in China's energy supply; acceleration of the development of new energy sources and renewable energy supplies; and ultimately a reduction in coal's share in the end-user market while promoting improved coal technology

in the meantime. Finally, both the ninth and tenth five-year plans state that there will be "appropriate" development in nuclear power, accelerating the pace towards locally developed capabilities in nuclear power generation that would be supplemented by foreign cooperation to pave the way for further development (presumably in the eleventh five-year plan and beyond).

Advanced technology will be promoted in order to achieve energy efficiency in production, transmission and end-usage. This aspect of the strategy includes technological renovation to improve energy conservation in certain industries and the promotion of energy-efficient products.

Plan by Energy Source

Oil and Gas

Indigenous Exploration & Production. Generally, the goal with respect to China's indigenous oil and gas resources is to stabilize production in the east (including Daqing), develop the north-west basins, and continue to pursue offshore opportunities. The north-west basins are seen as a "strategic transition" for the oil industry, away from the traditional fields of north-east China. These include three major basins in the Xinjiang region, namely, Tarim, Turpan-Hami and Junggar. Of the three, Tarim is thought to be the most promising (although results to date have not matched this optimism). To move oil and gas from the remote areas in which the north-west basins are located, current plans include a network of pipelines, principally from west to east.

Natural Gas. Natural gas is given developmental priority, with the objective of increasing gas's share in the total energy supply. It is projected that gas will account for 7% of the fuel source for electric power production by 2010. Gas imports will be encouraged to supplement domestic exploration and development. The tenth five-year plan recognizes that pipelines and LNG import terminal facilities are the underpinning of the increased role of natural gas in China's energy picture, and specifically highlights gas transport through the West-East Pipeline, the Guangdong LNG import terminal project, and pipelines from Chongqing to Wuhan, and from Xining to Lanzhou.

Foreign Investment. Whether in oil or gas, onshore or offshore, an unmistakable theme of the current plan is the encouragement of greater participation by foreign investors.

Strategic Reserve. A national strategic reserve programme is underway to promote national energy security. It is expected that several oil storage reserves will be built during the tenth five-year period and that such facilities will be funded by the government (or that the government will assist in financing them). While the government will operate most of the facilities, some will be reserved for operation by private parties.

International Investment. To supplement domestic production, an expansion of overseas exploration and development activities is mandated in three strategic regions: Russia/Central Asia, Middle East/North Africa, and South America. Certain countries, including Russia, Kazakhstan, Turkmenistan, Iran, Iraq, Sudan, Venezuela and Indonesia, are emphasized. The Angarsk (Russia)-Daqing pipeline is a priority in the goal to acquire resources from abroad. Pursuing oil and gas development on domestic and international fronts in tandem is often referred to as the "Two Resources, Two Markets" strategy.

Power

Generation. Large-scale "clean" power plants are emphasized in the ninth five-year plan. Correspondingly, continuing efforts will be made to reduce the number of small plants, and increase generation capacity in the larger, clean plants, including the installation of clean technology and the closing of smaller thermal plants that have exceeded their economic life. Gas-fired generation plants will be encouraged, consistent with the country's natural gas policy. Advanced technology, including co-generation, is emphasized to improve efficiency in the use of power generated.

Transmission. The tenth five-year plan stresses the need for improvement of the transmission network to exploit the increased generation capacity, continuing a theme that pre-dated the ninth plan. Efforts will continue to be made to improve and interconnect the power grids, including the deployment of long distance power transmission/transformation technology. A major objective of the tenth plan is to consolidate the incomplete regional and provincial power networks into interconnected north, south and central area grids.

Hydroelectric Power. Exploiting the abundant water resources in west/south-west China to generate electricity remains a staple of China's energy policy. This must be accomplished in tandem with transmission upgrades in order to enable transmission of generated hydroelectric power to consumption markets. Key projects mentioned in the tenth plan include Three Gorges, Gongbo Gorge (Upper Yellow River), Hongshuihe Longtan and Lancangjiang Xiaowan.

Coal

Role. Current plans acknowledge that coal will continue to be a dominant energy source, but express a desire to reduce coal's share in China's total energy supply.

Environmental Concerns. The acknowledgement of China's reliance on coal is matched by concern over the ongoing environmental damage being caused by coal usage.[26] A strong desire to invest in clean coal technology is a continuing theme in the tenth plan,

which includes the enhancement of coal bed methane. Both the ninth and tenth five-year plans reiterate the desire to implement coal-by-wire by encouraging the construction of large scale, clean power stations near major coal deposits.

Use of Technology. Accepting the continuing role of coal, the tenth five-year plan identifies the need to improve the economic efficiency and productivity of state-owed coal mines by way of technological renovation. The plan also prescribes efforts required to develop new mine facilities in anticipation of some older mines being closed by the eleventh plan period, including targeting new high-efficiency mines in Shanxi, Shaanxi, Inner Mongolia, Henan, Guizhou, Heilongjiang, Anhui and Shandong.

THE WAY FORWARD

This article has surveyed the development of China's energy plans at a policy level to help the practitioner better appreciate the context in which the current structure and strategy have evolved. But, as the seasoned practitioner knows, policies do not always translate into projects. Despite China's broad plans to achieve energy sufficiency, a critical question is whether China's institutional structures facilitate the plans the government has so meticulously crafted to address China's energy challenges. An equally important question is whether China's legal and regulatory regime provides an adequate basis for all of the participants in China's energy future to play the roles needed of them.

Future articles in this series will address these questions, first by discussing the role of China's energy institutions, including its national energy companies, in fulfilling the country's energy policy and strategy, both domestically and abroad, and then by examining the legal framework for foreign investment in China's energy market.

ENDNOTES

1 Carl Riskin, *China's Political Economy: The Quest for Development since 1949*, 1995, pp. 38-41, 53-54. See also James P. Dorian, *Minerals, Energy, and Economic Development in China*, 1994, pp. 53-54.

2 Riskin, pp. 40-41, 47, 76-77. See also Dorian, p. 4.

3 Chu-Yuan Cheng, *Economic Relations between Peking and Moscow: 1940-63*, 1964, p. 43; Dorian, pp. 56-8, citing figures from China's State Statistical Bureau.

4 Dorian, pp. 58. See also Yuan-li Wu, *Economic Development and the Use of Energy Resources in Communist China*, 1963, pp. 175-176.

5 Riskin, pp. 74-77; see also Chu-Yuan Cheng, pp. 42-45.

6 Riskin, pp. 130-131, 207; Dorian, pp. 58-62. For a more detailed account of the relationship between the two countries, see generally Chu-Yuan Cheng.

7 Riskin, p. 149.

8 Dorian, pp. 62-65.

9 Yingzhong Lu, *Fueling One Billion: An Insider's Story of Chinese Energy Policy Development*, 1993, pp. 5-6.

10 Dorian, p. 66.

11 But only for a brief period between 1970-1973. See Riskin, p. 207.

12 Dorian, p. 69. In particular, the Gang of Four took a hard-line stance against foreign participation in China's energy sector for fear that it would expose China to imperialist exploitation. See Riskin, p. 195.

13 Lu, pp. 6-7.

14 Lieberthal, *Governing China: From Revolution through Reform*, 1995, pp. 134-35; Dorian, pp. 70-71.

15 See, e.g., Xiannuan Lin, *China's Energy Strategy: Economic Structure, Technological Choices, and Energy Consumption*, 1996, p. 27.

16 See Vaclav Smil, *Energy in China's Modernization: Advances and Limitations*, 1988, p. 125.

17 Riskin, pp. 272-273; see also Smil, p. 104.

18 One commentator wrote that in the late 1970s "[a] picture of the Chinese Energy Crisis [would entail] the blackout of an entire urban district, the unheated home with crying babies, the exhausted peasants complaining over cold food they had been unable to cook, the idle industrial equipment sidelined by power shortages, and the suffering miners in the bankrupt coal industry". Lu, p. 4.

19 Smil, p. 170.

20 The seventh five-year plan. See also Dorian, pp. 78-80.

21 See Jimin Zhao, *Reform of China's Energy Institutions and Policies: Historical Evolution and Current Challenges* (discussion paper 2001-20, Belfer Center for Science and International Affairs, Energy Technology Innovation Project, Kennedy School of Government, Harvard University), pp. 18-20.

22 See Zhao, p. 5.

23 CNPC and Sinopec also were assigned shallow water areas within their regions while China National Offshore Oil Corporation (CNOOC), which saw the least change, retained rights in water depths greater thans 30 metres.

24 CNPC in 2000; Sinopec in 2000; and CNOOC in 2001.

25 See a general description of the functions and responsibilities of the NDRC in the organization's official web site (www.ndrc.gov.cn).

26 China's coal usage in 2002 increased by 28%. *BP Statistical Review of World Energy, 2002*.

China Energy Sector Survey Part II: The Energy Institutions

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In the first article of this instalment, our authors reviewed the origins, development and current energy policies of China. Here they discuss the structure of the institutions charged with implementing those policies.

China's energy institutions reflect its evolving energy policies. With the founding of the PRC, regulatory bodies were formed with dual responsibility for the production of energy and its regulation. As the government looked for ways to separate and rationalize these production and regulatory functions, the early years of the PRC energy sector saw significant changes in the institutional structures charged with these functions. As is the case with other emerging economies with a significant energy component, China's current institutional structure is a snapshot in time of its continuing effort to fine tune the balance between the production of critical energy resources and the management of that effort for the national good.

SETTING THE STAGE

Upon the formation of the PRC, an omnibus Ministry of Fuel Industry regulated the energy sector. The Ministry was responsible for oil, coal and electric power. In 1955, the government decided to abolish the Ministry of Fuel Industry, and distributed responsibility to newly created ministries of petroleum, electric power and coal industry. After further centralizations and decentralizations, the government re-established a Ministry of Coal Industry in 1975 and a Ministry of Petroleum Industry in 1978; the latter remaining intact until the national oil companies began to emerge from it.

The Ministry of Electric Power Industry, first created in 1955, was merged with the Ministry of Water Resources in 1983 to form the Ministry of Water Resources & Electric Power in order to consolidate oversight in both thermal and hydropower generation and transmission. Five years later, in 1988, further consolidation occurred when the Ministry of Energy was formed from parts of the former Ministries of Coal Industry, Nuclear Industry, Petroleum Industry and Water Resources & Electric Power. However, it was quickly abolished in 1993. Upon the ministry's dissolution, regulatory control over the electric power industry and coal industry was redistributed to a reconstituted Ministry of Electric Power and Ministry of Coal Industry. The State Economic & Trade Commission (SETC) was created in 1993 to coordinate the various energy industries that were now in the hands of separate ministries. The State Planning Commission (later to become the State Development & Planning Commission) continued to be responsible for long-term planning and policy development in the energy sector.

Significant regulatory changes in each of the major energy industries occurred in 1997 and 1998. The State Power Corporation was formed in 1997, and shortly thereafter in 1998 the Ministry of Electric Power was abolished. In its place, an Electricity Bureau was established within the SETC to oversee the State Power Corporation. Also abolished in 1998 was the Ministry of Coal Industry when the state mines managed by the ministry were handed over to the provincial governments. A State Administration of Coal Industry (SACI), to be supervised by the SETC, assumed regulatory responsibility for the coal industry. Also in 1998, the government consolidated the administrative functions of the Ministry of Chemical Industries and two of the national oil companies to create the State Administration of Petroleum & Chemical Industries (SAPCI), which was supervised by the SETC. By 2000, the SACI and SAPCI were disbanded. The SETC, assisted by respective industry associations, became the principal body overseeing the energy sectors.

More changes that further set the stage today were to occur in March 2003, which are discussed below.

EMERGENCE OF THE NATIONAL ENERGY COMPANIES

The tension experienced by the ministries and agencies charged to produce energy and to simultaneously regulate the sector caused an almost uniform response by the government to separate these functions, although the practical implementation of its response varied from industry to industry.

Oil and Gas

The earliest acknowledgement of the need to split the administration of the energy industry from the industry's commercial activities occurred in the oil and gas industry. At the time the national oil companies were formed, government administration and production functions resided with the Ministry of Petroleum Industry.

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China National Offshore Oil Corporation

On February 15 1982, the State Council created China National Offshore Oil Corporation (CNOOC) as the first state-owned oil company, and it was given responsibility for activities in the territorial waters of China. CNOOC was formed as a PRC state enterprise with legal person status, and was equivalent to a state bureau under the State Council. By 1988, it came under direct State Council supervision.

CNOOC's principal responsibilities included development of the PRC's offshore oil and gas exploration, development and production operations, but still included many administrative responsibilities associated with its development operations, including oil field support services, provision of social services, and the day-to-day regulation of operations. Pursuant to the *PRC Exploitation of Offshore Petroleum Resources in Cooperation with Foreign Enterprises Regulations* (Offshore Regulations), CNOOC was given the exclusive right to cooperate with foreign parties, with the right to take up to a 51% interest in the production sharing contracts (PSC) awarded to foreign enterprises. Its charter also gave it the right to undertake independent offshore exploration, development and production operations, although the right to do so in independent operations offshore China was later to be shared with Sinopec National Star Petroleum Company and, in shallow waters (below five metres), with the other national oil companies.[1]

China Petrochemical Corporation

China Petrochemical Corporation was the next national oil company to be formed, in 1983. It arose, in part, out of the separation of the refining and petrochemical functions of the Ministry of Petroleum Industry. China Petrochemical was a ministerial level enterprise and had responsibility for the processing and sales of refined petroleum products and petrochemicals, as well as overseeing the infrastructure required to do so. It also was responsible for the development and enforcement of policies in these areas.

A new corporate entity, also named China Petrochemical Corporation (hereafter referred to as the "new" China Petrochemical), was formed in 1988 as a PRC limited liability company, and given a quasi-monopoly to conduct international crude oil and products trading. The ministerial level or "old" China Petrochemical transferred most of its refining and petrochemical business to new China Petrochemical, but retained or transferred to other agencies its administrative responsibilities.[2]

China National Petroleum Corporation

China National Petroleum Corporation (CNPC) was formed in 1988 out of the onshore oil and gas exploration and production entities then remaining with the Ministry of Petroleum Industry (and thereafter the ministry was abolished, with its governmental functions transferred to the Ministry of Energy). CNPC's functions still included various governmental responsibilities, including the ministry's responsibility for providing ancillary social services, including schools, medical facilities and transportation infrastructure. On the commercial side, CNPC had exclusive responsibility for onshore exploration, development and production activities, both independently and in cooperation with foreign enterprises.

CNPC's authority was not limited to China, but also applied to overseas exploration and production, and associated refining and marketing of overseas production. It also received the right to import and export crude oil and refined products, including petrochemical products.[3]

Industry Restructuring

The oil and gas industry in China underwent a major reorganization beginning in March 1998. Key goals of the restructuring were to further separate regulatory and commercial functions, to improve the efficiency and competitiveness of CNPC and Sinopec and create world-class petroleum companies.

A key element of the restructuring was an asset exchange in which Sinopec transferred to CNPC numerous refineries, petroleum facilities and trading companies in the north-eastern, northern and western regions of China, and CNPC transferred to Sinopec various production enterprises located in eastern China. The upshot was an end to the monopolies that CNPC held in the onshore upstream and Sinopec held in the downstream areas, making each an integrated oil company with upstream, downstream and petrochemical operations. Rough geographical monopolies were maintained, with CNPC's assets being located primarily in China's north-eastern, northern and western regions, and Sinopec's assets located primarily in the south-eastern and southern regions.[4]

Restructuring also had as one of its purposes the goal of creating international-class petroleum companies. To do so, each of the national companies formed public stock entities whose shares would be made available to the public in a global stock offering.

PetroChina

CNPC formed PetroChina Company Limited (PetroChina) on November 5 1999, as a joint stock company with limited liability under the *PRC Company Law*. In its restructuring agreement of March 10 2000, CNPC transferred to PetroChina substantially all of its onshore exploration, development and production interests, which included exploration and production enterprises; its refining, transportation, storage and marketing (including import/export) business; and service stations. The transfer also included

associated oil and gas pipelines, research institutes and production sharing agreements with foreign enterprises.

CNPC retained a number of key assets, including CNPC's international projects, 3,600 gas stations and five chemical production facilities. And although CNPC did covenant not to compete with PetroChina in its principal areas of activity, it carved out exceptions for certain chemical complexes, marketing facilities, and international oil and gas projects. CNPC agreed to provide various services to PetroChina (finance, land leases, software licences, IP licences and technical assistance) through a "Comprehensive Products and Services Agreement", and granted PetroChina certain options to purchase its current and future interests in China and overseas. Conversely, PetroChina undertook to provide to CNPC limited products and services arising out of its operations.[5]

A global public offering of PetroChina Limited occurred in April 2000.

Sinopec

China Petroleum & Chemical Corporation (Sinopec Corp.) was formed as a PRC joint stock limited company on February 25 2000, with new China Petrochemical Corporation as its sole shareholder. As part of its pre-global offering restructuring, new China Petrochemical Corporation transferred most of its upstream and downstream interests to Sinopec Corp., as well as its business units responsible for the manufacture, sales transportation and trading (import/export) of petrochemical products.

China Petrochemical Corporation retained interests in certain petrochemical facilities, small capacity refineries and service stations, its oil field service businesses, and its ancillary service business responsible for construction, utility and social services.[6]

Sinopec Corp.'s global offering took place in October 2000.[7]

CNOOC Limited

The State Council formed CNOOC Limited on August 20 1999 pursuant to the HK SAR *Companies Ordinance*. CNOOC transferred to CNOOC Limited all of CNOOC's operational and commercial interests in the offshore oil and gas business, making CNOOC Limited the exclusive vehicle through which CNOOC engages in petroleum activities offshore China. Assets transferred included production sharing agreements with foreign enterprises, independent development projects, CNOOC's interest in Shanghai Petroleum and Natural Gas Co. Ltd, land use rights to various terminal facilities, loans and swap agreements with its banks, and employees to facilitate the transfer.

CNOOC also assigned to CNOOC Limited trademark licences, lease agreements for onshore facilities, and a wide range of administrative, social and oil field support services. As is the case with each of these reorganizations, CNOOC retained a number of assets, which included a petrochemical and LNG project in Guangdong province and a fertilizer plant in Hainan province. It also retained a number of administrative functions that it performed prior to the reorganization, such as: organizing international bidding and awards for offshore exploration; administration of certain aspects of PSCs; and the right to submit development plans, environmental impact and other reports to the PRC government.[8]

CNOOC proceeded with a global offering of CNOOC Limited in April 2001.

Electric Power

The first signs of an independent, commercial power entity appeared in 1985 when the State Council Coal-for-Oil Office contributed capital out of a special Coal-for-Oil Fund to form a group of nine Huaneng companies. Included among the nine companies was Huaneng International Power Development Company, a joint venture set up to attract foreign capital into the power sector. By 1988, the State Council approved the creation of China Huaneng Group Company.[9]

In 1997, pursuant to the policy of separating the roles of government and commercial enterprise, the State Council created the State Power Corporation.[10] The SPC was a corporate entity wholly owned by the state and with enterprise legal person status. It was intended to serve the role as "operator" and "manager" of electric power assets held by the Ministry of Electric Power, and to implement these responsibilities under administrative oversight and supervision by the government.[11]

The State Power Corporation's functions and responsibilities include: unified planning, construction, monitoring and management of the national power network; operation, management and modulation of inter-regional power grids and large-scale power plants that supply electricity across regions; and management of the state-owned shareholdings of its subsidiaries and affiliates.

Early in 2002, the State Council approved the Structural Reform Plan of the Power Industry.[12] A key purpose of the plan was to segregate generation and distribution assets. By December 2002, the State Council further approved a "Generation Assets Reorganization Scheme".[13] Under this scheme, assets of the State Power Corporation were allocated to two grid companies, five generation companies and four ancillary enterprises. These entities were officially established on December 29 2002. As part of this reform, the State Power Corporation was abolished.

Coal

Since the beginning of economic reforms in the early 1980s, the government encouraged town and village coal mines. In 1998, all key state-owned

mines previously under the direct management of the Ministry of Coal were handed over to provincial governments.[14] The result was three forms of production units in the coal industry: state-owned key coal mines; state-owned local coal mines; and town and village coal mines.

Modern enterprise management was introduced to the coal industry beginning in 1995. A number of the key state-owned mines underwent restructuring to become enterprise companies, with some listing shares in China and overseas. However, many of the state-owned mines could not withstand the competition from the proliferation of smaller coal mines, especially after the State Council decided to liberalize coal prices in 1993. Massive oversupply of coal from the town and village coal mines drove coal prices down. In 1998, the State Council decided to shut down small coal mines with illegal mining and "irrational layout".[15] The resulting reduction in coal output led to a rise in coal prices. But many state-owned mines could not survive. By 1999, the government took an unprecedented step and allowed poorly performing state mines to go bankrupt.

In the area of coalbed methane, China United Coalbed Methane Company Limited was established in 1996. It was specifically empowered by the State Council to conduct business activities relating to exploration for and production of coalbed methane gas. Since its inception, it has been involved in many projects with foreign partners to exploit resources in Anhui, Shanxi, Hubei and Ningxia.

CHINA'S INSTITUTIONS TODAY

Responsibility for the energy sector in China is generally divided between the regulatory functions of government and the commercial or production functions of the national energy companies, although the line is least clearly defined in the coal industry. The regulatory role is served by several national governmental bodies with overarching jurisdiction across the energy sector. There also are administrative or regulatory requirements that are peculiar to each industry.[16]

Responsibility for production of energy varies by industry. In the oil and gas industry, the function of commercial energy production is firmly placed in the national oil companies. In the electric power industry, we are still only at the beginnings of reform but the line between government administration and commercial production is brightening. The coal industry has yet to see a clear model of national coal companies, but appears to be moving in that direction.

National Level Administration

Any analysis of the regulatory structure of the energy industry in China starts with the near-universal constitutional proposition that the sovereign owns all mineral resources. The principal state bodies charged to oversee energy development in China are the National Development & Reform Commission (NDRC) and the Ministry of Land Resources (MOLAR). In matters relating to foreign trade and investment, the Ministry of Commerce (MOFCOM) will also be a major force. Since the major energy companies are centrally owned state enterprises, the State Asset Supervisory & Administration Commission (SASAC) will have a major role.

National Development & Reform Commission

The NDRC is the product of decisions made at the 10th National People's Congress in March 2003. It combines certain functions of the State Development & Planning Commission (SDPC) and certain functions of the now disbanded State Economic & Trade Commission (SETC).

A major responsibility of the NDRC is to plan the development and strategic upgrade of various industries that are key to the national economy, including the oil, natural gas, coal and power industries.[17] An Energy Bureau within the NDRC is in charge of analyzing the development and utilization of energy resources both domestically and abroad, and to draw up plans, policies and strategy for energy sector development and reform. The Energy Bureau also supervises the oil, gas, coal and electrical power sectors. The National Oil Reserve Office within the Energy Bureau will manage the national oil reserve.[18]

The NDRC will be an influential force in shaping the investment regime for foreign investors in the domestic energy sector as well as in setting the pace for China's oil and gas ventures abroad. For instance, the Office for the Utilization of Foreign Capital is in charge of formulating strategy for foreign direct investment within China and coordinating China's investments overseas, which includes investments by the national oil companies.[19]

Other functions to be performed by the NDRC that will affect the energy sector include coordinating revisions to the *Foreign Investment Guidance Catalogue* and reviewing large scale exploration projects and projects using substantial foreign exchange abroad.

Ministry of Commerce

MOFCOM was formed in 2003 as a consolidation of the functions of the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) and certain functions of the State Economic and Trade Commission (SETC), which was abolished. MOFCOM has a broad range of responsibilities across the spectrum of China's economy, which includes international economic and trade relations, WTO compliance and foreign investment. MOFCOM promulgates the *Foreign Investment Guidance Catalogue* jointly with the NDRC.

The Foreign Investment Administration (FIA) within MOFCOM has direct responsibility over

regulation of foreign investment. The FIA drafts plans, policies, and laws and regulations relating to foreign investment, and is responsible for their implementation and enforcement. Divisions within the FIA will set policies and mid-range planning for utilizing foreign capital within the industrial areas under its supervision.

For energy-related areas, two divisions within the FIA coordinate and guide the approval, filing and administration of projects involving foreign capital. The Service Trade Division has jurisdiction over: (i) public utilities in urban areas and various pipeline networks; (ii) onshore and offshore oil, gas and coalbed methane exploration and production; (iii) mining, including coal; and (iv) transportation. The Manufacturing Industry Division has jurisdiction over refineries, petrochemical, chemicals, metallurgy, power stations and related energy areas.[20]

Ministry of Land Resources

The key functions and responsibilities of MOLAR are in the planning, administration, protection and utilization of China's natural resources. From a reorganization in 1998 that eliminated relevant government departments, MOLAR acquired jurisdiction over the administration of mineral resources.[21] Today, it exercises its functions under laws and regulations stemming from the *PRC Mineral Resources Law*.[22] MOLAR functions and duties that are directly relevant to the energy sector include: mineral surveys and appraisals, including utilization plans; supervision of local land resources bureaus and resolution of disputes; granting licences for mineral exploration and production; and administering the registration and assignment of exploration and production licences.[23]

State Asset Supervisory & Administration Commission

The SASAC is a ministry-level commission that supervises the state-owned assets of all centrally owned enterprises other than those in the financial services industries, and charts the reform of the state-owned enterprises.[24] SASAC's principal role is to shepherd government reform and the restructuring of state-owned enterprises and assets by establishing standards for capital preservation and appreciation, perfecting corporate governance and administration, and applying high-level human resources management.

Industry-Specific Oversight

Oil and Gas

Today, no ministry or government body is charged exclusively with oversight of the oil and gas industry. This responsibility is divided among three of the national level governmental agencies described above: the National Development Reform Commission, the Ministry of Land and Resources and the Ministry of Commerce.

Through its Energy Bureau, the **NDRC** has responsibility for the approval of feasibility studies for oil and gas exploration, development and production, whether onshore or offshore. In addition, the NDRC must review investment projects proposed by national oil companies overseas; it also must review the involvement of foreign enterprises in oil and gas projects exceeding certain investment limits. Its responsibilities include publishing retail guidance prices for petroleum products; establishing unified natural gas prices and guidelines; approval of pipeline tariffs; publishing production targets; resolving pricing disputes between national oil companies; and publication of an annual natural gas guidance supply plan (for fertilizer supply).

MOLAR's principal authority over the oil and gas industry includes the designation of blocks for exploration; the approval of geological reserve reports; the review and granting of licences for independent and foreign oil and gas exploration and production; and the administration of the registration and assignment of exploration and production licences. Its authority is limited to the upstream area.

MOFCOM features in the regulation of the oil and gas industry in a number of areas. Due to its MOFTEC and SETC roots, a number of its functions have an "external" focus. While it has broad responsibility for the formulation of industry policy, its oil and gas oversight extends to two principal activities. First, it sets quotas and issues licences for the import and export of oil and refined products. Second, it approves PSCs and other joint venture arrangements with foreign enterprises.

The **State Environmental Protection Administration (SEPA)** is another relevant agency as the *PRC Environmental Protection Law* is applicable to the oil and gas industry, and regulates activities associated with exploration, development, production and refining activities, particularly where the installation or renovation of facilities or the discharge of pollutants is involved. An environmental impact report must be prepared for any new or renovated installations and the proponent must await certification that the proposed works are within the law's limitations on environmental impacts before proceeding with construction. Similarly, if a project proposes to discharge listed pollutants, a discharge permit must first be obtained.[25]

The Environmental Protection Law also provides that offshore oil projects must comply with relevant laws and rules on ocean pollution. One such law is the *Marine Environmental Protection Law*. Detailed rules applicable to offshore projects are found in the *Environmental Protection in Offshore Oil Exploration and Exploitation Regulations*. It requires project operators to submit environmental impact reports that identify preventive or mitigation measures.

Electric Power

The newly formed State Electricity Regulatory Commission (SERC) holds the regulatory reins today. The SERC grew out of the power industry reform plan. This agency was established in December 2002 and began official operations on March 25 2003.

Its responsibilities include:

- implementation of a unified regulatory regime for the power industry;
- proposing laws and drafting regulations governing the power industry;
- development of proposals for the ongoing reform of the power industry;
- monitoring the operations of the power markets;
- proposing price adjustments in accordance with market conditions;
- investigation of rule violations;
- settlement of disputes arising in power markets;
- enforcement of standards and specifications, including environmental laws (in conjunction with environmental protection agencies); and
- administration of licensing procedures of power industry operators (*Guobanfa* [2003] No. 7).

The Ministry of Water Resources (MWR) is an important player in China's hydroelectric power industry. The MWR drafts and reviews proposals and feasibility study reports for large-scale capital construction projects. It recommends sites for the construction of large and medium-sized hydropower stations. It also provides guidance to enterprises responsible for the management of water supply and hydropower development, and oversees the monitoring and management of safety issues associated with reservoirs and dams of hydropower stations.[26]

Coal

Activities in the coal industry are governed by the *PRC Coal Law* (1996) and related regulations. The Coal Law governs the establishment of coal mining enterprises, coal production and distribution, and transportation.

Following the March 2003 government reform, the NDRC (through, for example, its energy bureau and economics operations department) has become the key agency overseeing the coal industry on behalf of the State Council. MOLAR will be involved in reviewing applications to establish a coal mining enterprise, and in granting mining licences.

A licence must be obtained prior to the commencement of coal production. The Coal Law sets out certain conditions for granting the production licence. The State Council promulgated a set of administrative measures and detailed rules for administering the production licence process.[27] The jurisdictional authority for approval is divided into hierarchies (central or local).

The Coal Law also sets out conditions for granting permits to establish a coal distribution and transportation business. The State Council also has promulgated a set of administrative measures for administering the coal business permit process (the *Administration of Coal Business Procedures*). Once the coal business permit is granted, the applicant can register with the State Administration of Industry and Commerce (SAIC) or the local administrations of industry and commerce to obtain a business licence.

The import and export of coal is administered under a unified system. Upon approval by MOFCOM, qualified large-scale coal enterprises may engage in the coal import and export trade.

The Environmental Protection Law is also applicable to the coal industry. Operators must demonstrate that their proposed activities comply with applicable environmental laws or propose preventive or mitigation measures in order to receive a mining permit, production permit or coal business permit. The *PRC Air Pollution Prevention Law* also will have an impact on coal operations. It requires that coal mines producing high-sulphur and high-ash coal install coal washing facilities. It also requires installation of desulphurization and emission control equipment in new or expanded power plants. These measures are part of the government's efforts to promote clean coal technology.

MOLAR is the principal authority regulating the coalbed methane industry. Exploration and production of coalbed methane is mainly governed by the *Mineral Resources Law* and related regulations, e.g. the *Administration of Registration of Mineral Resource Exploration Blocks Procedures*, and the *Administration of Registration for Exploitation of Mineral Resources Procedures*. For foreign cooperation projects, the Onshore Regulations would also apply.

CHINA'S NATIONAL ENERGY COMPANIES TODAY

A range of structures exists under the state energy company mantle. In oil and gas, the national oil company structure is most pronounced and akin to that in many other petroleum-rich countries in the world. In the electric power sector, the newly formed generation companies have the hallmarks of national energy companies, but the absence of any operating history makes a conclusive assessment premature. And the coal industry still labours under a more distributed structure, with a few "state coal companies" and a proliferation of provincial and local enterprises and mines dominating the scene.

Oil and Gas

PetroChina and Sinopec are today the dominant onshore operating companies in China. PetroChina has responsibility for provinces in the north, north-east and west of the country and Sinopec has responsibility in the east and south-east. As

a result of the 1998 reorganization, each is now a vertically integrated company, with responsibility for exploration, development, production, refining and marketing in their respective regions. CNOOC Limited continues to be the principal operator in offshore China, with increasing international assets, and no downstream operations. Sinochem, the fourth national oil company, is a relative newcomer to the operational side of the oil and gas industry, having only assumed responsibility for exploration and production activities in 2002.

PetroChina

PetroChina is the largest oil and gas company in China, when measured by oil and gas production. It is structured into six key operating units: (i) exploration and production; (ii) refining and marketing; (iii) chemicals; (iv) natural gas and pipelines (including crude oil and refined products); (v) international; and (vi) import/export. PetroChina is authorized by the State Council to engage in oil and gas exploration and production activities both onshore and in offshore waters of less than five metres. As is the case with Sinopec and CNOOC and its controlling shareholders, PetroChina cooperates with CNPC (PetroChina's controlling shareholder) through a series of connected transactions for a wide range of products and services associated with its principal business operations.

PetroChina is the owner and operator of Daqing, China's oldest and largest oil and gas field. It also owns and operates the Liaohe and Xinjiang oil fields. Collectively, these fields comprise over two-thirds of PetroChina's domestic interests in oil. PetroChina also operates the natural gas fields of Sichuan and Changqing, with the latter being the largest natural gas region in China. In 2002, fields under PetroChina's ownership and control averaged daily production of 2.096 million barrels of oil and 1,658 million cubic feet of natural gas.

PetroChina's downstream operations include 23 refineries, which processed 569 million barrels of crude oil in 2002. It has 10,961 service stations that it owns and operates. Petrochina supplies the large majority of its crude oil to its own and Sinopec's refineries. Nearly all of the feedstock provided to PetroChina's refineries comes from its own production. PetroChina's 2001 joint venture with BP in Guangdong and Fujian provinces operated 293 service stations at the end of 2002. PetroChina also manufactures a wide range of petrochemical products through 13 chemical plants located in five provinces and three autonomous regions.

PetroChina operates the largest network of pipelines in China, due to the near-exclusivity enjoyed by CNPC, its controlling shareholder, in the upstream business prior to reorganization in 1998. The network includes over 12,000 kilometres of gas pipelines, 9,200 kilometres of crude oil pipelines and 2,276 kilometres of refined products pipelines. PetroChina also is the sponsor of the 2,500-mile West-East pipeline that is under construction from Xinjiang to Shanghai.

PetroChina's overseas operations have to date included interests in south-east Asia, including Indonesian interests acquired from Devon Energy and Amerada Hess. PetroChina imports and, to a lesser extent, exports crude oil and refined products through one of its subsidiaries, China National United Oil Corporation, which has a licence and quota to import and export crude oil and refined products.[28]

Approximately 90% of the share capital of PetroChina is owned by CNPC, as controlling shareholder. Brandes Investment Partners, BP Investments China Limited and Berkshire Hathaway Inc. own the remaining shares.

Sinopec

Today, Sinopec is the second largest integrated petroleum company in China. Its organizational structure, which emphasizes its background in the downstream business, has four key operating units: (i) exploration and production; (ii) chemicals; (iii) refining; and (iv) oil products sales. Like PetroChina, Sinochem is authorized by the State Council to engage in oil and gas exploration and production activities onshore, and offshore in waters less than five meters deep.

Sinochem held 294 exploration licences and 193 production licences, including licences in the Shengli field in Shandong, China's second largest oil field, at the end of 2002. It operates 11 producing fields, which in 2002 had an average daily production of 739,000 barrels of oil per day and 490 million cubic feet of natural gas per day. It produces 23% of the total crude production and 15% of the total natural gas production in China.

Primarily because of historical circumstances, Sinochem is the largest refiner and seller of refined products in China, with 25 refineries processing 105 million tons of oil in 2002. Only 27% of the feedstock to these refineries is supplied by Sinopec operations, while over 50% is supplied by imported oil. Sinopec also operates China's largest distribution network for refined petroleum products, which includes 19 provinces in its region. It operates 24,000 service stations, with another 4,000 being operated by third parties. It also is the largest petrochemical manufacturer in China through its operation of 17 petrochemical plants. Sinopec's 70%-held subsidiary, China International United Petroleum and Chemicals Co., Ltd, is licensed to import crude oil and refined products subject to quotas set by MOFCOM.[29]

About 55% of the outstanding share capital of Sinopec Corp. is owned by the (new) China Petrochemical Corporation. China Development Bank, China Xinda Asset Management Corporation and the general public account for the second largest bloc of shareholdings.

CNOOC Limited

Unlike PetroChina and Sinopec, CNOOC Ltd is technically considered an "independent" since its exploration and production assets are independent of any downstream assets. Along with Sinopec National Star Corporation, it has co-extensive responsibility for independent petroleum activities in the territorial waters of China at depths greater than five metres deep. Operations in shallow waters are shared with PetroChina, Sinopec and Sinopec National Star Corporation. CNOOC Ltd has no onshore jurisdiction.

Like its sister companies, CNOOC Ltd conducts operations both independently and with foreign partners. Its largest producing area is in Bohai Bay, followed by production in the western South China Sea. At the close of 2002, CNOOC Ltd's domestic interests produced an average of 298,625 barrels of oil per day and 272,000 mcf of natural gas per day from both independent operations (CNOOC Ltd sole operations) and those involving foreign enterprises. Slightly more than half of its production came from its cooperative joint ventures with foreign partners.[30]

CNOOC Ltd has the option to participate in LNG projects in which CNOOC invests, including the right to acquire CNOOC's 33% interest in the Guangdong LNG import and re-gasification terminal, as well as the associated upstream natural gas reserves. It also has options with respect to CNOOC's interest in a natural gas distribution system in Zhejiang province, pipeline and LNG facilities in Shandong province, as well as in CNOOC's agreement with the Fujian provincial government covering natural gas supply and market development there.

CNOOC Ltd's international assets, which are operated in conjunction with foreign partners, are considerable. It owns a 12.5% interest in the Tangguh LNG project, which is comprised of several offshore Indonesia PSCs. (The Tangguh partners have a 25-year contract to supply 2.6 million tons per year of LNG to an LNG terminal project in Fujian province.) CNOOC Ltd has acquired Repsol YPF S.A.'s interest in four PSCs in Indonesia in April 2002, as well as a 39.5% interest in a PSC in Indonesia's Malacca Strait. Most recently, CNOOC Ltd is reported to have signed an agreement to acquire an interest in the Gorgon LNG project off the Northwest Shelf of Australia, including the associated upstream reserves.[31]

CNOOC owns about 70% of the outstanding share capital of CNOOC Ltd.

Sinochem

Sinochem is the newest entrant in the field. Historically, Sinochem has been an export and import company with broad, although not exclusive, responsibility for crude oil and petroleum products. Since 2002, it has been authorized to pursue exploration, development and production activities abroad. It has since acquired Atlantis Norway Holdings HS, which owns oil and gas blocks in Tunisia, Oman and the United Arab Emirates.[31]

Sinochem's most recent restructuring has not affected its prominence in the import and export of petroleum and petrochemical products in China. It also continues to be active in oil transportation, terminals and storage, as is exemplified by its Aoshan Terminal. Similarly, Sinochem has a large presence in the transportation and distribution of petrochemicals through its joint venture ownership in the Shanghai Orient Terminal Company. It also owns a 33.6% interest in the WEPEC joint venture oil refinery in Dalian. Sinochem's import, export and domestic sales of fertilizer account for 60% of the Chinese fertilizer market. It also produces a range of petrochemical products through its chemicals business.

Electric Power

As a result of the 2002 Structural Reform Plan of the Power Industry and the ensuing Generation Assets Reorganization Scheme, two grid companies, five generation companies and four ancillary companies were formed.

The five generation group companies are: Huaneng,[32] Datang, Huadian, Guodian and China Power Investment. The size, quality and geographic distribution of the assets are roughly even, with each generation company owning no more than 20% of the nation's generating capacity. The allocation included assets in large-scale hydroelectricity projects and shares of smaller power companies previously held by the State Power Corporation. But it did not include the China Three Gorges Project Corporation, which had been established in 1993 and operates independent of the five generation companies.

As for grids, two companies have been formed: the State Grid Corporation of China (State Grid) and the China Southern Grid Company Limited (Southern Grid). The State Grid is responsible for establishing five regional grid operators. They are: North China Power Grid Co. Ltd; Northeast Power Grid Co. Ltd; Northwest China Power Grid Co. Ltd; East China Power Grid Co. Ltd; and Central China Power Grid Co. Ltd.

The Southern Grid will consist of the grid assets of Guangdong Electric Power Co. and Hainan Electric Power Co. and the grid assets of the State Power Corporation in Yunan, Guizhou and Guangxi.

The four ancillary companies are: China Electric Power Engineering Consulting Group; China HydroPower Engineering Consulting Group; China National Water Resources & HydroPower Engineering Corporation; and China Gezhouba Group. These companies provide support services to the electric power industry.

Coal

Except in the case of coalbed methane, the concept of a national coal company or similar entity undertaking

commercial activity on behalf of the government has not taken hold. There are a number of coal corporations in China, but none yet serves a role in the coal industry that is analogous to the roles served by the national oil companies or the power generation companies. However, the government has plans to nurture the development of several large-scale group companies to enable them to compete in the global coal economy. Some of these coal companies will have integrated business activities covering coal mining and production, power generation, transportation and shipping. Two of these companies are China National Coal Group Corporation and Shenhua Group Corporation Limited.

The predecessor of the China National Coal Group Corporation (CNCGC), the China Coal Import and Export Corporation (CCIEC), was formed in July 1982.[33] Currently, the CNCGC oversees an integrated coal operation from production to distribution, import and export, power generation, mining machinery, chemicals, high tech industries and finance. It has established trade and economic cooperation with more than 50 countries and areas around the world.

Shenhua Group Corporation Limited (Shenhua) was first created in October 1995 by carving out certain coal businesses from the Huaneng Group. Today, Shenhua is the largest coal enterprise in China with integrated coal mining, transporting and power generation operations. It operates mines in the Shenfu Dongsheng coal field, which straddles Shaanxi province and Inner Mongolia. Recently, Shenhua disclosed that it had held talks with ChevronTexaco to discuss opportunities for cooperation in a coal liquefaction project to which the government had given high priority. First commercial production is anticipated to come on line in 2005.

The future of China's key coal companies may be intertwined with the generation companies created in the recent power industry reforms. For instance, CNCGC announced that it has entered into a Long Term Strategic Cooperation Framework Agreement with Huaneng in June 2003. The cooperative arrangement envisions: (i) a coal buy/sell agreement to provide Huaneng's power generation plants with a stable supply of coal; (ii) co-development of coal production bases in China and abroad; (iii) co-development of coal gathering and distribution centres in China's coastal regions; and (iv) building "coal by wire" power plants at CNCGC's coal mines. In August 2003, Shenhua also announced that it had entered into a Long Term Cooperation Agreement with Huaneng. It was also reported that China Power Investment entered into a Strategic Cooperation Framework Agreement with Pingdingshan Coal Group.

In the area of coalbed methane, the China United Coalbed Methane Company Limited (CUCMC) is specifically empowered by the State Council to conduct business activities relating to coalbed methane gas. It currently has about 20 blocks under exploration with foreign partners who, as a matter of practicality, are limited to companies with technology and operational experience in coalbed methane exploration and production. Operations are conducted pursuant to production sharing contracts that are similar in form to PSCs used for oil and gas activities. As provided in the Onshore Regulations as amended in 2001, CUCMC is the only entity authorized by the government to partner with foreign investors to undertake coalbed methane exploration, development and production.

FUTURE CHALLENGES

The energy industry in China is the focus of increasing attention and concern by both the central government that is charged to regulate it and by the national energy companies that are responsible for producing the much-needed energy supplies. Hardly a week passes without a new report about the escalating challenges facing China's energy institutions to identify a sustainable source of supply for the country's growing energy demands. Meeting these demands will require efficiency both in the oversight and in the production of energy resources.

The challenge to both the regulators and the national commercial operators is clear. The regulators have a broad responsibility to both facilitate energy production and to manage production in such a way so as to maximize the benefits internally. The challenges in doing so will arise in a number of areas, including establishing appropriate production and pricing guidelines, import and export licences and quotas, and environmental standards. Actions in each of these areas will affect the viability of the industries it regulates and the level of supply they produce. In addition, the WTO presents a challenge to the government that requires it to open its energy markets while at the same time ensuring a steady stream of energy production by the new regime demanded by WTO.

For the national energy companies, the pressure to produce is increasing. And as the demand for energy grows, so does the competition for this energy, whether within China or outside its borders. With liberalization under the market access agreements subscribed to as part of WTO membership, the once-secure markets in China eventually will have to face foreign companies that will compete with the Chinese national energy companies to produce or import China's badly needed supply. In addition, developing environmental standards will raise the bar for Chinese companies and foreigners alike. Likewise, around the globe, there will be increasing competition for the scarce energy resources that many nations, including China, seek. This will also require the Chinese national energy companies to perform at international standards.

In the next and last part of this series, we will look at the legal framework for foreign investment in the Chinese energy sector, including areas that are yet to open to foreign investment.

ENDNOTES

1 See generally China National Offshore Oil Corporation Global Offering Prospectus, pp. 46-60.

2 See generally China Petroleum and Chemical Corporation Global Offering Prospectus, pp. 77-82.

3 See *Guobanfa* [1988] No. 44. The *PRC Exploration of Onshore Petroleum Resources in Cooperation with Foreign Enterprises Regulations* (the Onshore Regulations, adopted in 1993), further defined CNPC's right to enter into exploration and production arrangements with foreign companies onshore. See also PetroChina Company Limited Global Offering Prospectus, pp. 73-77.

4 See *Guobanfa* [1998] No. 14. See also China Petroleum and Chemical Corporation Global Offering Prospectus, pp. 58-59.

5 PetroChina Company Limited Global Offering Prospectus, p. 74-76.

6 See generally China Petroleum and Chemical Corporation Global Offerings Prospectus, pp. 77-82.

7 Shortly thereafter, the Onshore Regulations were revised to give Sinopec the right to enter into cooperative arrangements with foreign enterprises.

8 See generally CNOOC Global Offering Prospectus, pp. 46-60.

9 See a chronology of events (in Chinese) found in the web site of China Huaneng Group (www.chng.com.cn); see also Huaneng Power International, Inc.'s Annual Report on Form 20F, p. 17.

10 State Council Notice Concerning the Formation of the State Power Corporation (*Guofa* [1996] No. 48). The policy to create the State Power Corporation could also be traced to the Ninth Five Year Plan and the 2010 Long Range Objectives Outline.

11 With the establishment of the State Power Corporation, Huaneng Group Company was put under the SPC as a wholly owned subsidiary.

12 See press release of the State Development Planning Commission, April 11 2002. An English translation was published in *China Law & Practice*, June 2002, 16(5), pp. 34-36.

13 According to a Xinhuanet news report, Beijing, December 29 2002.

14 See *Guofa* [1998] No. 22.

15 See *Guofa* [1998] No. 43.

16 It is beyond the scope of this article to analyze the provincial or country administrative organs, or even the various tangential national bodies that have an influence on the regulation of the energy sector.

17 See *Guobanfa* [2003] No. 27, para. II-6.

18 *Ibid*, para. III-12.

19 *Ibid*, para. III-9.

20 See *Guobanfa* [2003] No. 29; Shangbanfa [2003] No. 7.

21 See *Guobanfa* [1998] No. 47.

22 These laws and regulations include: the *PRC Mineral Resources Law*; the *PRC Mineral Resources Law Implementing Rules*; *Administration of Registration for Exploitation of Mineral Resources Procedures*; *Administration of Registration of Mineral Resource Exploration Blocks Procedures*; *Transfer of Exploration Rights and Mining Rights Procedures;* and the *Administration of Granting and Assigning Mining Industry Rights Tentative Provisions*.

23 A detailed analysis of the mining exploration rights in the PRC can be found in Ward and Izzard, "Exploration Rights in the PRC: The 'How to and Where to Guide'," *China Law and Practice*, May 2003, 17(4), pp. 20-22.

24 See *Guobanfa* [2003] No. 28.

25 There are additional regional and local environmental standards governing principally infrastructure siting and discharges.

26 See *Guobanfa* [1998] No. 87.

27 *Administration of Licensing of Coal Production Procedures*.

28 See generally PetroChina Form 20F (June 2003), pages 15-46.

29 See generally Sinopec Form 20F (June 2003), pages 13-28.

30 See generally CNOOC Form 20F (June 2003), pages 22-39.

31 In addition to these energy-related activities, Sinochem owns interests in hotel and catering, financial services and investment management, shipping, information technology and tendering.

32 In January 2003, the State Council approved the reorganization of the Huaneng Group Company (*Guohan* [2003] No. 9).

33 In 1992, its name was changed to China National Coal Industry Import and Export Corporation. In 1997, China National Coal Industry Import and Export (Group) Corporation was formed by incorporating several coal-related entities, including China Coal Sales and Transportation Corporation, China Local Coal Mines Corporation, China Coal Production Technology Development Company and Pingshuo Coal Industry Company. In 1999, the company incorporated another eight coal-related entities. In April 2003, the company changed to its current name.

China Energy Sector Survey Part III: Foreign Inbound Investment

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In the final part of our China energy sector survey, the authors examine the legal framework for foreign investment in energy across the oil and gas, electric power and coal industries.

A thread that has run through the first two instalments in this series has been China's challenge in confronting its burgeoning demand for energy. Since this series was conceived, China has moved from being the third to the second largest consumer of energy in the world, and has edged ahead of Japan.

The International Energy Agency predicts that US$2.3 trillion will need to be invested in energy supply infrastructure in China over the next 25 years to keep up with its energy requirements.[1] Of this amount, domestic investment in the search for oil is estimated at US$119 billion, while investment in gas infrastructure is estimated at just under US$100 billion,[2] with much of this earmarked for distribution networks.[3] Investment needs in the electric power area over the next 25 years are expected to hover around US$2 trillion. Half of this investment will be in transmission and distribution infrastructure[4] (where foreign investment is currently prohibited), while investment in new power plants is estimated to amount to US$795 million.[5] Finally, it will be necessary to inject US$123 billion into China's coal industry over the next 25 years to round out China's supply picture.[6]

Building the energy supply infrastructure in China over the next 25 years will require the investment of significant resources by the Chinese, and the broader international, energy communities. In this last article in the series, we examine the legal structures that are in place to facilitate foreign investment, including some of the changes that can be expected in the near future as China restructures its energy sector and makes modifications to its legal structures to satisfy its accession obligations to the World Trade Organization (WTO).

FOREIGN INVESTMENT IN ENERGY GENERALLY

Foreign investment in the energy sector, like investment in other industries, is subject to PRC government oversight. There are two principal governing documents: *Guiding the Direction of Foreign Investment Provisions* (the Guidelines, effective April 1 2002) and the *Foreign Investment Industrial Guidance Catalogue* (the Catalogue, also effective April 1 2002). The Guidelines describe the characteristics of activities that are subject to four categories (encouraged, restricted, prohibited, permitted), and that determine the acceptability of a foreign-invested enterprise or activities in China, while the Catalogue describes the specific industries or activities that are included in the encouraged, restricted and prohibited categories.[7]

Foreign investment in the energy sector is addressed by the Catalogue and includes industries and activities in all categories. Some activities are prohibited outright; others require a Chinese partner; and still others are encouraged and attract beneficial tax rates or exemptions. The assignment of the various categories is a reflection of China's commitment to certain WTO accession principles as well as its commitment to the growth of its own economy. For the latter, China seeks to both enhance its development, and at the same time strengthen the ability of its national energy companies to compete when its energy markets are fully opened.

FOREIGN INVESTMENT IN OIL AND GAS

The tenth five-year plan seeks to stabilize production in the east, develop the northwest basins and continue to pursue offshore opportunities. Natural gas is a developmental priority, and natural gas pipelines and LNG import terminals are the underpinnings of the increasing role of gas. To achieve these goals, the tenth five-year plan encourages greater participation in the oil and gas sector by foreign investors.

To date, foreign investment in various areas of the oil and gas sector has lagged behind expectations. The main reasons for this are policy-based or economic. However, from a legal perspective, the basic framework for foreign investment in the oil and gas sector is firmly in place and is generally better defined than the structures created for foreign investment in other energy sector industries.

Upstream

The 2002 Catalogue identifies oil and gas exploration and development as encouraged.[8] This encouragement is accompanied by a plethora of laws, regulations and guidelines that serve to structure foreign investment in this area.

Foreign investment in the upstream oil and gas sector has been more significant in China's offshore areas than onshore. As of December 31 2002, CNOOC

had over 30 production sharing contracts (PSCs, the documents that govern the operational and financial life cycle of a project) with foreign investors, while PetroChina is party to 14 PSCs. Sinopec is involved in only a handful of foreign-invested development projects in China.[9] One reason for this difference may relate to the length of time foreign investment in China's offshore has been allowed. Offshore projects were opened to foreign investment in 1982, concurrent with the formation of the China National Offshore Oil Corporation (CNOOC). At that time, the State Council promulgated the *PRC Exploitation of Offshore Oil Resources in Cooperation with Foreign Parties Regulations* (Offshore Regulations). The regulations established the legal and operational framework under which CNOOC was to work with foreign investors in connection with the exploitation of offshore oil and gas resources.

China's onshore areas have been open to foreign investment only since 1993, when the State Council promulgated the *PRC Exploitation of Onshore Oil Resources in Cooperation with Foreign Parties Regulations* (Onshore Regulations). The Onshore Regulations identify China National Petroleum Corporation and (since 2001) Sinopec as the two national oil companies responsible for participation in any agreements associated with foreign cooperation.

The foreign investment regime for upstream oil and gas activities is clearly the most complex, or at least the subject of the most legal oversight and scrutiny, of the foreign investment schemes in the oil and gas sector. Foreign investment here is governed by a matrix of laws, regulations, circulars and opinions, and is overseen both by national oil companies, with whom foreign investors are required to partner and execute PSCs, and a number of state and provincial institutions, depending on the level of investment.

The Onshore and Offshore Regulations

The Onshore and Offshore Regulations are nearly identical. Under these Regulations, CNPC and Sinopec are responsible for conducting onshore exploitation, and CNOOC for offshore exploitation, as well as the exclusive responsibility for negotiating and performing contracts with foreign entities for exploitation in areas approved by the State Council. Exploitation contracts (generally in the form of a PSC) must be approved by the Ministry of Commerce (MOFCOM). Onshore PSCs may be entered either by way of public tender or negotiation. Where the block is located offshore, the award must be preceded by a public tender.

By virtue of the limitations imposed by the Catalogue, the parties to a project under either the Onshore or Offshore Regulations are expected to enter into a cooperative joint venture (CJV) pursuant to the *Sino-foreign Cooperative Joint Venture Law*. The foreign party in a cooperative joint venture is required to establish a presence in the PRC by way of a branch, subsidiary or representative office, and in a location to be agreed with the Chinese partner.

The CJV must appoint an operator, which can be either the foreign partner or the Chinese partner; however, the Chinese partner is responsible for obtaining the requisite approvals before development operations may be conducted where the foreign party is the operator. The foreign partner is responsible for undertaking all financial risks associated with the exploration phase of the project. Hence, all costs and expenses of exploration are borne by the foreign partner until a commercial discovery is made. Thereafter, the foreign partner is entitled to recover its exploration costs, plus a return on investment, under the cost recovery methodology negotiated in the PSC. The foreign partner is entitled to export its share of production or to sell it to its Chinese partner (with the corresponding right to repatriate its income abroad in accordance with the foreign exchange rules). Once the foreign partner has recovered its investment, all equipment installed by the foreign partner becomes the property of the Chinese partner. Furthermore, the Chinese partner owns all data and information acquired pursuant to development operations from the time of their creation.

Additional Legal Requirements

The Onshore and Offshore Regulations are only the starting point for foreign investment in the upstream area. Both Regulations explicitly provide that exploitation of offshore and onshore areas in cooperation with foreign parties must be conducted in compliance with "relevant laws, regulations and rules of the PRC and must be subject to the supervision of the relevant authorities of the PRC government".

The principal laws and regulations are identified in the endnote.[10] They govern the life cycle of an upstream project, from the identification of blocks for exploration through production to the disposition of the block.

The *PRC Mineral Resources Law* (MRL, adopted in 1986, and amended in 1996) sets the backdrop and tone for all mineral exploration and exploitation in the PRC, including oil and gas development through foreign investment. Under the law, mineral resources are owned and managed by the state, and any party seeking to exploit them must register to do so. The Ministry of Land Resources (MOLAR) is the principal agency in charge of the oversight of mineral development activities. The MRL sets broad standards for the conduct of mineral activities, including conformity with labour and environmental requirements set by PRC law. It also requires that resource developers be subject to tax and the payment of other mineral compensation to the state.

The MRL is heavily policy-oriented and also provides for a broad range of internal requirements that serve to maximize the value of the mineral

resources for the state. These provisions range from the requirement of mineral surveys through restrictions on the construction of incompatible structures in mineral areas to the establishment of legal liability standards for mineral developers.

The *PRC Mineral Resources Law Implementing Rules* came into effect in 1996 and generally provide more detailed guidance on the rights and obligations of mineral developers. The Rules require exploration and development licences prior to undertaking activities and set out the corresponding rights and obligations of licence holders.

The Rules also require the preparation of medium and long term plans for state wide mineral exploration, which serve to assist MOLAR in setting the term of a production licence and evaluating requests for its extension.

The *Administration of Registration of Mineral Resource Exploration Blocks Procedures* (the Exploration Procedures) govern the registration system and are applicable to foreign investment in mineral resources generally. Under the Exploration Procedures, each area open to exploration is divided into units, with the largest units being allocated to oil and gas exploration. However, only those blocks approved in advance by the State Council may be made available to foreign investment. An exploration licence must be obtained from both the state and the provincial or local government before operations can commence. The applicant for an exploration licence, in the case of foreign-invested oil and gas activities, is the Chinese partner, who must provide plans for the exploration and development of the block and documents evidencing the qualifications of the party responsible for the operation. In the course of reviewing an application for an exploration licence, the approval authorities have the right to impose restrictions on the parties' agreement as well.

An exploration licence for oil and gas is valid for up to seven years, and may be extended for up to two years at a time. During the licence period, licensees must undertake minimum annual work commitments each year of the licence; excess expenditures are creditable to the next year. Work commitments in the oil and gas sector are generally divided in the PSCs in three areas: acquisition of seismic data and information; drilling of exploration wells; and commitment of other exploration expenditures. The specific nature and amounts of these work commitments are negotiated into the PSC.

Once a commercial discovery is made, the *Administration of Registration for Exploitation of Mineral Resources Procedures* (the Exploitation Procedures) come into play. These regulations require foreign investment enterprises to obtain a development or production licence before the commencement of production. MOLAR has principal responsibility for issuing production licences at the national level, though some projects will still be subject to scrutiny by the provincial and local governments based on their size.

Like the application for an exploration licence, a production licence application must be made by the Chinese partner and accompanied by evidence of the foreign contractors' qualifications, its development or production plans and an environmental report.

The term of a production licence varies, based on the scale of the project: large projects attract up to a 30-year term; medium scope projects up to 20 years and small projects up to 10 years. Term extensions are available. Issuance of the production licence is to be preceded by the preparation of a reserve report, which identifies the anticipated productive life of the field, which in turn determines the initial term of the licence. However, in the case of oil and gas PSCs, the production period is normally fixed at 15 years, subject to extension.

Production Sharing Contracts (PSCs)

The PSC will have the most impact on the life of the project from exploration through development to production. The PSC embodies as contractual terms and conditions a number of the basic provisions of the Onshore and Offshore Regulations, the requirements of the relevant mineral development laws and regulations, and the provisions of the exploration and production licences. Ultimately, as the name implies, the PSC determines the sharing of production from a successful exploration endeavour, including the formula by which the foreign investor recovers its risk investment made during the exploration phase.

The foreign investor and the relevant Chinese national oil company are the parties to the PSC. In the case of the Chinese partner, only the state company may negotiate and execute a PSC, whereupon it may assign it to its publicly listed entity. The undertakings between the national oil companies and their publicly listed affiliates generally allow representatives of the publicly listed company to participate in the negotiation of the PSC.

Under the PSC, one party is designated as the operator. A joint management committee comprised of representatives of the parties supervises the activities of the operator. The operator manages the day-to-day activities of the joint venture and has responsibility for the preparation and execution of work programmes and budgets, equipment procurement, the funding of operations via cash calls, hiring crew to conduct operations, maintaining records and the oversight of all other operations associated with the work programme agreed by the parties. Where the foreign investor (referred to as the Contractor) is the operator, the Chinese partner has the right to take over operations once the Contractor has recovered its share of exploration and development costs.

Under the PSCs, the Contractor is required to bear all costs and expenses in the exploration phase. The

Contractor is required to relinquish acreage following each phase of exploration until a Development or Production Area is delineated. Once a discovery is made, the Chinese partner has the right to take up to a 51% participating interest in the block. At this point, after the payment of production taxes to the PRC government, the Contractor is entitled to recover its current share of development costs and its exploration investment plus interest out of production through a cost-recovery formula provided in the PSC. The remaining value of the production stream is allocated to the government royalty obligation and then divided between cost recovery oil and remainder oil. Royalty is paid to the PRC government on a sliding scale that ranges from 0% up to 12.5% for oil based on production volume and 0% to 3% for gas, also based on production. Recovery "oil" (including non-associated natural gas) is earmarked to reimburse the parties for their current development costs and, once monthly costs are recovered on a current basis, the excess recovery oil is applied to pay down the Contractor's exploration investment. The remainder oil is then divided between the PRC government and the parties on the basis of each partners' respective participating interest. The Contractor has the right to sell it in the international market or it may sell it to its Chinese partner.

Midstream (including Transportation) and Downstream

Foreign investment in the midstream and downstream phases of the oil and gas sector is less structured and regulated than in the upstream area, although areas of commercial uncertainty, e.g., fiscal stability, market-based pricing, regulatory transparency, etc., may be correspondingly greater. The midstream and downstream areas that tend to attract foreign investment occur in four general areas: pipeline transportation, LNG receiving and regasification terminals, refining (including petrochemicals) and marketing (wholesale and retail).

Transportation

The "construction and operation of oil (gas) pipelines" is encouraged in the 2002 Guidelines. The 2002 Guidelines eliminated the requirement that the Chinese party hold a majority stake, although no foreign investor appears to have taken advantage of this change to date. In addition, gas distribution is now merely restricted and requires majority ownership by the Chinese party. Moving gas distribution from the prohibited category to the restricted category is a recognition of the condition of this segment of the industry and the need for improvement if natural gas utilization is to be increased.

Liquefied Natural Gas (LNG)

LNG activities, which from China's point of view principally mean receiving terminals and regasification facilities, are not mentioned in the 2002 Guidelines per se (though gas depots are encouraged), despite the facilities under construction, and the proliferation of planned terminals, along the east coast of China. Thus, in the absence of any mention in the Guidelines, these activities are considered areas in which foreign investment is permitted.

Oil Refining and Manufacture of Petrochemicals

The construction and operation of oil refineries is restricted and requires "overall state balancing". In contrast, a wide range of petrochemical manufacturing, from the manufacture of ethylene through synthetic rubber to biological agrochemicals, is encouraged under the 2002 Catalogue. However, investment in facilities that manufacture ethylene with an annual production capacity greater than 600,000 tons requires Chinese majority ownership.

Marketing

Foreign participation in the wholesale and retail markets is technically restricted. Although characterized as restricted, foreign investment in the wholesale side of the downstream business is effectively prohibited until December 11 2006, at which time foreign investment is "permitted to deal" in both crude oil and refined products (called "processed oil"). In the absence of this permission, only state-controlled companies have licences to import or export crude oil and refined products.[11]

On the retail side, foreign investors will be permitted to establish wholly owned enterprises and "permitted to deal" in processed oil by December 11 2004. However, there is still a restriction, under which foreign investors may not be permitted to hold a controlling interest in "chain stores" that have more than 30 outlets.

Investment in Midstream and Downstream

Unlike the upstream end of the oil and gas sector, there are no substantive laws and regulations governing foreign investment in the midstream and downstream portions of the business. Thus, subject to the approval and ownership/participation restrictions placed on foreign participation by the 2002 Catalogue, activities in these areas are principally governed by standard joint venture laws and related company laws and regulations. And unlike the Onshore and Offshore Regulations, which prescribe adherence to the CJV structure, no particular form of business entity is prescribed for midstream or downstream activities involving foreign enterprises.

Foreign investment in the downstream area has varied by project type. For instance, foreign investment in oil refining has been very limited, principally due to the high cost of entry and the historic duopoly held by Sinopec and CNPC. Still, a number of major foreign oil companies have interests

in refineries in China, as well as lubricant plants, bitumen manufacturing plants and storage facilities. Foreign participation in oil refining is increasingly tied to the manufacture of petrochemicals; a number of integrated petrochemical projects are underway that include the installation or enhancement of oil refining capacity to provide feedstock for the petrochemical complex (an encouraged activity).

Foreign investment in the gas processing and petrochemicals end of the downstream business has a long history in China. Several world-scale petrochemical complexes are today located in China, and they are foreign-invested. The highest profile projects have been joint ventures by the local arms of foreign investors such as BASF,[12] BP,[13] Dow,[14] ExxonMobil[15] and Shell[16]. Their projects include petrochemical complexes, storage facilities and terminals.

The retail side of the downstream business has seen limited foreign investment over the years, but currently is the subject of significant foreign investment attention. Three major foreign investors are positioning themselves for a key role in China's downstream market. BP and Sinopec have recently announced formation of a joint venture to build 150 gas stations in Zhejiang province and to expand to 500 stations within three years. BP also has announced a similar joint venture with PetroChina for 500 service stations in Guangdong province. Shell and Sinopec have reportedly entered into a joint venture under which they would jointly operate 500 retail stations in Jiangsu province. And ExxonMobil is reported to be in a joint venture with Sinopec to open 500 stations in Fujian province.

The transportation side of the energy sector probably has seen the least foreign investment. The best known transportation project in China currently is the West-East Pipeline (WEP), running from Lunnan in westernmost Xinjiang province to Shanghai, which is expected to carry 12 billion cubic metres of natural gas annually. A Joint Venture Framework Agreement was signed in July 2002 between PetroChina and affiliates of ExxonMobil, Shell, Gazprom (each holding a 15% interest) and Sinopec (holding a 5% interest), though discussions to advance the foreign investment in the WEP are reported to be on hold. Recently, the first segment of the WEP from Jianbian in Shaanxi province to Shanghai was completed and gas is being delivered into Shanghai. Other foreign-invested pipelines are under discussion, primarily those originating in bordering Russia (Angarsk and Kovytka) and Kazakhstan, but the ownership mix has not been agreed. It is possible that national oil companies or other governmental entities within their respective territories will exclusively own each of these pipelines.

Impact of World Trade Organization (WTO) Accession Commitments

Many of the current laws and regulations in place are the result of the PRC's efforts to comply with its WTO accession commitments. The 2001 amendments to the Onshore Regulations and Offshore Regulations are the product of concerns that the old regulations might violate the PRC's accession obligations. The 2001 revisions lifted the restriction on foreign parties to sell their share of production to their Chinese partner and eliminated the preference for Chinese personnel and goods and supplies. Likewise, changes between the 1997 and 2002 Catalogue, particularly those provisions in the restricted category eliminating majority ownership in certain enterprises by Chinese partners, are linked to the PRC's desire to meet its WTO accession promises.

In addition to the areas opened up to foreign investment under the 2002 Catalogue, the Annex to the Catalogue identifies areas that will be the subject of future relaxation to meet the requirements of WTO compliance. The most significant changes ahead in the oil and gas sector due to WTO will be in the wholesale/retail markets. WTO accession obligations require China to allow foreign ownership in its retail markets by December 11 2004, and wholesale markets by December 11 2006. Other areas in which restrictions were recently relaxed include tariffs and import quotas. Tariffs on imported crude oil have been eliminated and tariffs on gasoline and lube oil have been reduced. Likewise, import quotas and licence requirements for refined or processed oil (described as gasoline, kerosene, diesel, lubricants and the like) were recently relaxed, thus allowing foreign investors to apply for a direct import licence. Remaining quotas and licence requirements are to be eliminated by January 1 2006.

The upstream area is expected to see no further changes in anticipation of WTO than those imparted in the 2001 Onshore and Offshore Regulations. The 2002 Catalogue maintains the requirement that oil and gas risk exploration and production must be conducted in cooperation with Chinese partners.

FOREIGN INVESTMENT IN ELECTRIC POWER

Tenth Five-Year Plan

The tenth five-year plan emphasizes the continuing reduction of small plants and the corresponding increase in generation capacity in larger, clean plants. Gas-fired generation plants are encouraged, as is the installation of clean technology to improve the efficiency of generated power. While transmission improvements and interconnections are also stressed, as will be seen below, this area is off-limits to foreign investment.

Catalogue Characterization

Under the 2002 Catalogue, foreign investment in the power sector is generally encouraged. The only area

that is closed to foreign investment is in the construction and operation of power grids. The construction and operation of conventional coal burning power stations with a single generator capacity of 300,000 kW or less (except small power grids) is restricted, and it may be difficult to secure approval.

The 2002 Catalogue limits the permissible form of investment vehicles for certain kinds of power projects. In the areas of power generation (including thermal, hydroelectric and nuclear), and distribution and transformation equipment that exceeds certain specification requirements set out in the Catalogue, foreign investment must be made through either an EJV or CJV.

The construction and operation of power stations employing clean coal technology, co-generation facilities, natural gas power stations, hydroelectric power stations primarily intended for power generation, and power stations employing new alternative sources of energy are all in the encouraged category. Fossil fuel power stations with a single generator capacity of 300,000 kW or more also are encouraged. The Catalogue does not limit foreign investment in these projects to EJVs or CJVs.

Although nuclear power stations are also encouraged, the Chinese party must hold a majority interest, which requires a joint venture arrangement.

Procedures for Entry

Application of the Bidding Law

The *PRC Invitation and Submission of Bids Law* (the Bidding Law), as a practical matter, applies to most power projects. Article 3 of the Bidding Law requires that bids must be tendered to undertake engineering and construction projects (including survey, design, construction, supervision and procurement) of the following types:

- large-scale infrastructure, public utilities and other projects involving the public interest or public security;
- projects wholly or partially financed by the state or in which state-owned funds are invested; or
- projects using loans or aid funds from international organizations or foreign governments (except that the respective lender or fund provider may determine the bid invitation process as long as the public interest of the PRC is not thereby violated).

There are few circumstances under which the engineering and construction of a power project would not be subject to the Bidding Law; most power projects fall into one of the three categories requiring its application.

Approval Process and Requirements

The approval process for foreign investment in power projects corresponds to the approval process for foreign investment enterprises generally, but has requirements that are specific to the power sector. Two documents are particularly relevant here: the *Foreign Investment in Power Projects Several Provisions*, issued March 20 1997, which made reference to the *Reporting and Approval Procedures for Direct Foreign Investment in Power Projects Tentative Provisions*, promulgated on December 9 1996 (*Dianji* [1996] No. 723).[17] The over-arching import of these documents is that foreign-invested power projects must be consistent with state industrial policies, and be included in a five- or ten-year plan unless the project receives special permission from the state.[18]

Foreign investors may invest in China's power sector by way of EJV, CJV or WFOE vehicles. Foreign investment also may occur through the purchase of shares in domestic companies. Build-Operate-Transfer arrangements are another option.[19] Nuclear power projects and hydroelectric power projects over 250MW are not open to WFOE investments; instead, these projects may only proceed in the form of an EJV or CJV, with PRC state-owned assets accounting for a majority (51%) interest.[20] Although the CJV laws and regulations permit CJVs with non-legal person status, a CJV power project will probably have to opt for legal person status. For instance, legal person status is required for all newly built, expanded or renovated large or medium-sized thermal power generation projects.[21] In addition, a power project must have legal person status in order to enter into a power purchase agreement with grid operators.[22]

Joint ventures may be formed with the Chinese party using "inventoried assets", in which there are two possibilities. The first is a simple change of capital structure, involving the transfer of some of the assets of the Chinese party's existing power station to the foreign party in order to form a joint venture and to jointly run the existing power station. The second possibility is an expansion of and change in capital structure, involving the investment of assets of an existing power station by the Chinese party and of cash or equipment by the foreign party in order to form a joint venture. This option permits parties to jointly run an existing power station, or to renovate an existing power station or to build a new one.[23] Special rules apply to the review and approval of joint ventures using inventoried assets.[24]

The commercial operating terms for power projects involving foreign investment may generally not exceed 20 years for thermal power stations, 30 years for hydroelectric power stations and 25 years for nuclear power stations (or plants). Where "inventoried assets" are used, the actual term may be based on the results of asset valuation, but must not exceed the limits stated above.[25]

Approval Authorities

Unlike the general foreign-invested enterprise approval practice, which centres on the size of the

total amount of investment, approval for power projects is different because energy production is a sector still heavily subject to state planning practices. Most power projects are capital intensive and involve state funds. In addition, power projects are actually classified as requiring "State Overall Balancing", and generally call for central approval. This authority rests with the NDRC in most cases. For significant projects, which would include projects involving large investment amounts (over US$100 million) or those identified by the central government as key projects, State Council approval is required upon referral from the NDRC.

Document Requirements

For an EJV or CJV to obtain approval to establish the project (*lixiang*), a project proposal, together with an approved letter of intent signed by the parties and evidence of the foreign party's credit worthiness, will be submitted to the local planning authorities for preliminary review. The local planning authorities will then refer the project proposal to the NDRC for approval.

Once *lixiang* approval is obtained, the project investors/partners may prepare a Feasibility Study Report (FSR). The FSR will be submitted to the local planning authorities for preliminary review, and then be referred to the NDRC for approval.[26] The FSR must be accompanied by approval documents from (and where applicable contracts with) central and provincial level administrations regarding environmental protection, land use, water use, fuel supply, transport and grid price, etc. In addition, contracts or other documents pertaining to preliminary design, equipment procurement and overseas financing will be necessary. Finally, the package must include the joint venture agreement signed by the parties and charter documents for the project company.[27]

A number of agencies other than the NDRC also will be involved in the FSR approval stage. Each of these will review the FSR, and issue approval in support of the FSR. For example, MOFCOM has now assumed the role of the former MOFTEC in making sure that the joint venture agreement and charter documents for the project company conform to foreign investment laws. The State Administration of Foreign Exchange (SAFE) will review issues relating to foreign exchange and foreign credit.

The State Environmental Protection Administration will scrutinize the project's environmental compliance, especially if coal is used as the fuel source. Foreign investors must ensure that the project will be in compliance with environmental obligations at every stage of the approval process.

Upon approval of the FSR by the NDRC and MOFCOM's approval of the joint venture agreement and charter documents, MOFCOM will issue a Foreign Investment Enterprises certificate, whereupon the project company may apply to the State Administration for Industry & Commerce (SAIC) to obtain a business licence.[28]

For a WFOE, the process and document requirements are generally similar. A preliminary application report and a project report are required in the place of a project proposal and FSR.[29]

Impact of Restructuring

China's power sector recently has undergone major structural and regulatory reorganization. Five power generation group companies have been established to take over the generation assets of the former State Power Corporation (SPC). Likewise, two grid companies now operate the grid assets of the SPC. Meanwhile, a new State Electricity Regulatory Commission (SERC) has been created to oversee the power sector. And it is expected that the *PRC Electric Power Law*, the principal law governing the power sector, will be amended to suit the change in circumstances that have taken place since its original promulgation in 1995. The various regulations that govern or otherwise affect foreign investment in the power sector may be changed accordingly afterwards. But for now, it is not clear whether there are more opportunities for foreign investment as a result of the reform of the power sector.

Operating Issues

Grid Connection and Dispatch Agreement. Power producers need to be connected to a power grid to supply power to the market. The *Administration of Power Grids Dispatch Regulations*, effective November 1 1993 and the *Administration of Power Grids Dispatch Implementing Rules* effective October 11 1994, set out the conditions that must be met in order for a power plant to be connected to the grid.[30] A power project will need to enter into a grid connection and dispatch agreement with a grid operator.

Basic terms of a grid connection and dispatch agreement are set out in Article 31 of the *Administration of Power Grids Dispatch Implementing Rules*. Recently, the SERC published a model contract. The basic terms cover areas such as the technical conditions for interconnection; peak load, frequency and voltage modulation, backup/reserve capacity, dispatch plans, safety measures and accident handling procedures.

Power Purchase Agreements (PPA). A power project sells electricity by entering into a PPA with a grid operator.[31] A PPA may be short term (less than one year) or long term (up to 20 years). For power projects with foreign investment, whether EJV, CJV or WFOE, the duration of a long term PPA may not exceed the term of the project described in the approved FSR.[32]

The *Power Supply Business Regulations*, October 8 1996 (Article 90) and the *Standardizing Administration of Power Purchase Contracts Tentative Procedures* (Articles 7 and 8) require certain basic terms to be

included in a PPA, such as the interconnection mode, quantity and quality of the electricity generated, time of electricity generation, measurement of quantity transmitted, grid price, and methods to resolve discrepancies between the actual and the planned quantity of power purchase.

Recently, the SERC issued a model short term (one year) PPA. Instructions to the sample contract, however, provide that parties may utilize the model contract, negotiate a long-term master PPA, and then execute annual PPAs with reference to it.

Electricity Pricing

A nationwide competitive power market is on the horizon. Market pricing structures are being tested in specifically approved regions, e.g., in northeastern China. Meanwhile, electricity prices are still under state control. Although power projects may negotiate prices with grid operators, the electricity price is subject to ratification by the State Price Bureau. The *Standardizing Administration of Power Purchase Contracts Tentative Procedures* require all PPAs to contain the initial electricity price and its calculation method. The electricity price must be determined in accordance with principles set out in the *PRC Electric Power Law.* These include: the recovery of reasonable costs; the determination of gains in a reasonable manner; and the inclusion of taxes.[33] For grid price, the basic principle is "same grid, same quality, same price".[34]

The *PRC Electric Power Law* and the *Standardizing Administration of Power Purchase Contracts Tentative Procedures* prohibit the supplier from changing price without approval.[35] Electricity prices may be adjusted, but probably no more frequently than on an annual basis. For example, the model PPA issued by the SERC is designed to set electricity prices annually. Usually, the project and the grid operator can determine the grid price for the coming year by negotiation. Adjustments are subject to ratification by price control authorities.

The SERC has conducted a thorough review of electricity prices across the country, and reaffirmed certain restrictions aimed at curbing violations in electricity pricing.[36]

FOREIGN INVESTMENT IN COAL

Role in the Tenth Five-Year Plan

While aiming to reduce coal's share in China's total energy supply, the PRC government acknowledges that coal will continue to be a dominant energy source. The current five-year plan expresses a strong desire to invest in clean coal technology and to better exploit coalbed methane resources. China also appears to welcome foreign investment that includes technology to improve the efficiency and productivity of China's coal mines.

Characterization in Catalogue

Under the 2002 Catalogue, exploration for and development of coal resources is encouraged. The Catalogue itself does not limit the form of foreign investment in coal mining. The 2002 Catalogue also addresses foreign investment in construction and operation of coal pipeline transportation facilities, which is categorized as encouraged. The Catalogue does not limit the form of investment in this respect.

The coal sector is not expected to attract sizeable foreign investment. However, opportunities for foreign investors may be found in the application of new technologies such as coal liquefaction and gasification. For instance, Shenhua Group, one of the major coal companies in China, has been working with foreign investors to develop a coal liquefaction facility.

Coalbed Methane (CBM)

Under the 2002 Catalogue, exploration for and development of CBM is encouraged. Foreign investment in CBM will be conducted along the lines set out in the Onshore Regulations referred to above. The Onshore Regulations also give the China United Coalbed Methane Company (CUCBM) the exclusive right to partner with foreign investors in CBM activities. As with oil and gas, only those blocks approved in advance by the State Council may be made available to foreign investment. Operations are conducted pursuant to a PSC that is similar in form to those used in onshore oil development. A PSC for CBM is usually 30 years in duration, which encompasses the exploration, development and production phases.

CBM is subject to the legal regime imposed by the Mineral Resources Law and its implementation regulations described above. The Exploration Regulations and the Production Regulations apply to CBM in much the same way as they apply to oil and gas upstream activities. Only the Chinese party may hold an exploration licence for CBM, and therefore CUCBM will make such an application. The exploration licence shall be valid for up to seven years, and may be renewed for no more than two years at a time. The minimum work commitments apply for CBM as they do for upstream oil and gas activities: for the first year of exploration, Rmb2,000 per square kilometre; Rmb5,000 per square kilometre in the second year; and Rmb10,000 per square kilometre from the third year onward.

Exploration licence fees are also payable and calculated on the basis of the size of the exploration block. For the first three years the fee is Rmb100 per square kilometre, which is then increased by Rmb100 per square kilometre starting in year four to a maximum of Rmb500 per square kilometre.

Prior to production, a mining licence must also be obtained from MOLAR pursuant to the Mining Registration Regulations. A mining licence user

fee is also payable on an annual basis at a rate of Rmb1,000 per square kilometre.

CONCLUSION

The foreign investment regime for energy varies in China, from the detailed matrix of laws and regulations that govern oil and gas exploration and production to the generic provisions that address only the formation of joint ventures to manufacture petrochemical products. There appears to be little correlation between the detail of the regime and the level of foreign investment. In the end, the level of foreign investment in the energy sector in China may have more to do with the policies and economics of the individual industry and activity than with the comprehensiveness of the foreign investment regime or ease of entry.

Still, there are a number of observations that emerge from an analysis of the legal structures that support foreign investment in the energy sector. Clearly, the upstream oil and gas area is comprehensive and in need only of fine-tuning. However, the transportation area, while now encouraged, appears to been in need of broad substantive measures to better define the role of foreign investors in that sector generally. Likewise, in the area of natural gas distribution a comprehensive framework of regulation for investment will be necessary before the benefits of the natural gas supply chain are fully realized. Finally, to the extent that the great majority of infrastructure investment over the next 25 years is expected in the electric power area, predictability will be important. The impact of the recent restructuring on foreign investment is uncertain and will need to be clarified if meaningful investment in this area can be expected from abroad.

Readers are referred to the first two instalments in this series, which appeared in the November 2003 and December 2003/January 2004 editions, respectively.

ENDNOTES

1 International Energy Agency, *World Energy Investment Outlook: China Energy Investment Outlook 2003 Insights*, pp. 43-44.

2 *Ibid*, p. 47.

3 *Ibid*, p. 50.

4 *Ibid*, p. 63.

5 *Ibid*, p. 64.

6 *Ibid*, p. 59.

7 Only three categories are included in the Catalogue because if an industry or activity is not specifically listed as encouraged, restricted or prohibited, it is considered permitted.

8 Also encouraged in the upstream area are: "development of oil/gas pools (fields) in low permeability formations"; "development and application of new technologies for increasing the crude oil recovery factor"; "development and application of new technologies for petroleum exploration and development such as geophysical prospecting, drilling, logging, downhole operation, etc.".

9 Nevertheless, Sinopec had 294 exploration licences and 193 production licences at the end of 2002.

10 *PRC Invitation and Submission of Bids Law; Administration of Invitation and Submission of Bids, Auction and Listing of Exploration Rights and Mining Rights Procedures (Trial Implementation); PRC Mineral Resources Law; PRC Mineral Resources Law Implementing Rules; Administration of Registration of Mineral Resource Exploration Blocks Procedures; Administration of Registration for Exploitation of Mineral Resources Procedures; Transferring Exploration Rights and Mining Rights Procedures; Administration of Granting and Assigning Mining Industry Rights Tentative Provisions.*

11 Foreign investors also have the right under their PSCs to export crude oil allocable to their participating interest.

12 BASF/Sinopec Yangtze Petrochemical JV in Nanjing.

13 BP/Sinopec/Shanghai Petrochemical JV in Shanghai (SECCO).

14 Dow UCC Tianjing Ethylene JV.

15 ExxonMobil/Saudi Aramco/Fujian Petrochemical JV (proposed).

16 Shell/CNOOC/Guangdong Province JV at Daya Bay.

17 These provisions were promulgated based on the general principles under the laws and implementing rules governing the formation of EJVs, CJVs and WFOEs, to specifically detail the document requirements and procedural steps for foreign investment in power projects. It should be noted, however, that these provisions do not apply to projects involving the use of inventoried assets, nor to BOT projects. These are governed by separate regulations respectively. Investment in the nuclear power industry must also comply with additional industry specific regulations.

18 *Dianji* [1996] No. 723, Article 2.

19 *Ministry of Power Industry, Foreign Investment in Power Projects Several Provisions*, March 20 1997.

20 *Ibid*, Article 11.

21 *Implementation of Legal Person Responsibility System for Electric Power Construction Projects Provisions, Dianjian* [1997] No. 79, February 5 1997, Article 2.

22 *Standardizing Administration of Power Purchase Contracts Tentative Procedures*, September 29 1996, Article 4.

23 *Power Industry Use of Inventoried Assets for Joint Ventures with Foreign Companies Economic Appraisal Implementing Rules (Trial Implementation)*, September 22 1996, Article 2.

24 *Examination and Approval Procedures for Power Industry Use of Inventoried Assets to Attract Foreign Investment Provisions*, July 19 1996.

25 *Foreign Investment in Power Projects Several Provisions*, Article 12.

26 *Dianji* [1996] No. 723, Article 10.

27 *Ibid*, Article 11.

28 See the EJV Implementing Rules and CJV Implementing Rules.

29 *Dianji* [1996] No. 723, Articles 13 to 18.

30 See, e.g., *Administration of Power Grids Dispatch Implementing Rules*, October 11 1994, Article 30.

31 See *Standardizing Administration of Power Purchase Contracts Tentative Procedures*, Article 4.

32 *Ibid*, Article 8.

33 *Electric Power Law*, Article 36.

34 *Ibid*, Article 37.

35 *Ibid*, Article 43; *Standardizing Administration of Power Purchase Contracts Tentative Provisions*, Article 16.

36 *Fagaijiajian* [2003] No. 1152, issued on September 11 2003.