

THE ENERGY
REGULATION
AND MARKETS
REVIEW

SEVENTH EDITION

Editor
David L. Schwartz

THE LAWREVIEWS

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AND MARKETS
REVIEW

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PREFACE

In our seventh year of writing and publishing *The Energy Regulation and Markets Review*, we have seen dramatic changes in global energy policies. Europe has experienced a strong economic rebound, which has allowed many countries to dedicate increased resources to the infrastructure needs of the energy sector, including for renewables. While the United States commenced efforts to withdraw from the Paris Agreement, the signatories to the Paris Agreement countries have continued to make efforts to reduce greenhouse gases (GHGs). There is still a significant need to invest in infrastructure, and we have seen significant investment throughout the supply chains in the oil, gas and power sectors globally. The 2011 Fukushima nuclear incident continues to impact energy policy in many countries, and we continue to see extensive liberalisation of the energy sector. Oil prices have started to rebound somewhat, which presents some hope to those countries that remain dependent upon oil prices for national revenue.

I CLIMATE CHANGE DEVELOPMENTS

With respect to climate change efforts, the Paris Agreement was placed into effect on 4 November 2016, but President Trump announced last year that the United States would be withdrawing from the Paris Agreement. Nonetheless, we continue to see significant carbon reduction efforts, such as increased development of renewable resources, as well as energy efficiency and demand reduction measures, globally, including in the United States.

Following the Brexit vote, the United Kingdom closed its ‘renewable obligation’ programme to new generation, and limited new contracts for differences, which has significantly reduced new renewable construction this year. France has announced a plan to close all coal-fired power plants within five years, double the capacity of wind and solar renewable generation and prohibit shale gas production and all new searches for hydrocarbons. Denmark continues to seek to have renewable energy meet all of its electricity demands by 2050, and over the past year has initiated an effort to improve the output of solar and wind resources through technology improvements. The Netherlands has a goal of reducing GHGs by at least 25 per cent by 2020, and has announced its intent to close all coal plants by 2030. While Germany will likely miss its 2020 renewable energy goals, it has an ambitious goal to achieve 65 per cent renewable generation capacity by 2030. Belgium has continued its effort to develop offshore renewable wind resources (including the development of an offshore grid), but has reduced historical green certificate subsidies. Italy is seeking to reduce carbonisation by having a goal of relying on renewable resources for 28 per cent of its energy needs by 2030. Switzerland has continued to promote the development of renewables and is supporting the development of large-scale hydroelectric resources through state subsidies.

Spain is seeking to reach 20 per cent renewables by 2020, and has initiated new auctions for 6,000MW of new renewable installed capacity. Turkey seeks to have 30 per cent renewables by 2023.

China released a plan to have 15 per cent of its energy supplied by non-fossil fuels, 20 per cent from natural gas and no more than 58 per cent from coal by 2020. Korea's goal is to cut GHGs by 37 per cent by 2030, and it is seeking to have 95 per cent of all new installed capacity come from clean energy sources and to shut down coal power plants that are more than 30 years old. India's announced goal to have at least 40 per cent of its installed electric capacity powered by non-fossil fuels may be overshadowed by the fact that it is developing and constructing 50,000MW of new coal-fired generation capacity. Japan is looking at offshore wind and a variety of other new renewable energy sources to assist with the reduction of capacity following the shutdown of most of its nuclear generation capacity. Malaysia has been working hard to reduce its overdependence on coal and natural gas, and to encourage the production and use of renewable energy in an effort to meet its target of 50 per cent renewable resources by 2050. As of last year, 33 per cent of the installed capacity in the Philippines was from renewable resources, and 35 per cent was from coal generation. The United Arab Emirates continues its efforts to reduce its carbon footprint, announcing a goal of having 25 per cent of its capacity from renewables by 2030, and 75 per cent by 2050. South Africa relies upon coal generation for 85 per cent of its generation capacity but has taken steps to increase the development of renewable resources. Australia is adding significant new renewable resources to meet its 2020 renewable energy targets.

While the Trump Administration is seeking to reverse the Obama administration's Clean Power Plan, we are seeing continued significant investment in renewable energy development in the United States. Individual states are moving forward to achieve reduced reliance on fossil fuels and greater reliance on renewable energy, including California and New York, which are seeking a 50 per cent renewable portfolio standard goal by 2030, and Hawaii, which is seeking 100 per cent reliance on renewables by 2045.

II INFRASTRUCTURE DEVELOPMENT

For many countries, reliable energy supply is the primary concern, regardless of fuel source. Rural electrification and system reliability remain priorities in India, Indonesia, Myanmar, Mozambique, Angola, parts of Nigeria and Central and West Africa and we are seeing significant efforts to pursue electric generation and transmission projects in those regions. Turkey seeks to increase energy industry infrastructure in the power sector and the oil and gas sectors, in light of an estimated 6 per cent demand growth per year through 2023. Denmark has a new North Sea Agreement to secure future exploration and production of hydrocarbons from the North Sea. Panama continues to seek to attract foreign investment to assist with badly needed transmission and generation infrastructure needs. The 8 May 2018 announcement by President Trump that he intends to withdraw from the Iran nuclear deal and institute significant new sanctions is expected to present a significant roadblock to further foreign investment in the Iranian energy sector.

III NUCLEAR POWER GENERATION

Seven years after the Fukushima disaster, Japan has stopped operations for 43 out of its 48 nuclear power stations, and 14 nuclear power stations are in the process of complying

with new safety standards for possible restart. Germany continues to phase out all nuclear generation by 2022. Belgium is seeking to dismantle all nuclear plants by 2025. France is seeking a reduction of nuclear power generation to 50 per cent of total electricity production within five years. Switzerland and Korea are planning to limit the life of their nuclear generation units, with Korea abandoning the construction of six new nuclear power plants and cancelling the extension of others.

On the other hand, Turkey is continuing with development of the Akkuyu nuclear power plant (first unit estimated to be operational in 2023), and the United Arab Emirates is almost finished with the construction of the Barakah nuclear power plant, both of which are expected to be operational in 2020. South Africa is facing substantial resistance to its efforts to develop 9,600MW of new nuclear generation capacity. India's goal of 40 per cent non-fossil fuel generation is expected to require a substantial ramp-up of nuclear generation capacity.

In the United States, the early retirement of certain nuclear plants has been driven by cost and power market considerations, rather than safety concerns. Some nuclear owners in the United States have sought state subsidies in New York, Illinois, Ohio and Pennsylvania, among others, in order to avert premature retirements. Illinois and New York have implemented legislative and regulatory payment programmes for nuclear facilities in those states, but they are currently being challenged on constitutional grounds and remain pending before US federal circuit courts of appeal.

IV LIBERALISATION OF THE ENERGY SECTOR

We have seen significant energy sector regulatory reforms in many countries. Italy is seeking to reduce the gap between price and cost of energy, compared to the rest of Europe. Portugal continues to work on liberalising its electricity and gas markets. Japan has now fully liberalised the retail electricity sector. And we are seeing continued efforts to encourage further privatisation of the electricity sector in the United Arab Emirates and in certain countries in Central and West Africa. Turkey is seeking to privatise its generation assets. Brazil has seen significant privatisation, including the auction of four hydroelectric plants. Given Switzerland's interest in promoting the use of renewable resources, it has suspended a planned 49 per cent divestiture of its state-owned hydroelectric fleet. China has made moves to deregulate energy pricing. In a move away from privatisation, Colombia ordered the liquidation of Electricaribe (owned primarily by Gas Natural Fenosa), which is now in arbitration.

I would like to thank all the authors for their thoughtful consideration of the myriad of interesting, yet challenging, issues that they have identified in their chapters in this seventh edition of *The Energy Regulation and Markets Review*.

David L Schwartz

Latham & Watkins LLP

Washington, DC

May 2018

CHINA

*Monica Sun and James Zhang*¹

I OVERVIEW

Energy regulation in China involves a number of stakeholders including various governmental authorities that heavily regulate the energy sector, monopolistic state-owned enterprises (SOEs), private companies that are trying to catch up, foreign companies that have had varying degrees of success, and a vast number of consumers. Currently, and for the foreseeable future, energy regulation in China is anchored in China's ambitious economic restructuring agenda. Top priority is being placed on environmental goals and the deployment of cleaner energy in China's economic reform plan. The 'energy revolution' proposed in the 13th Five Year Plan for National Economic and Social Development (2016 to 2020) is divided into three main sections, namely the upgrade of the energy structure, the development of energy transmission network, and the establishment of a smart energy internet.

China, as one of the largest economies globally, is deeply embedded in the global energy value chain. The effects of China's energy consumption and production extend well beyond its borders.

China's prominent role in the global energy market underlines the importance of understanding China's domestic energy regulation regime and its market structure. This chapter aims to provide an overview of China's energy market and regulatory regime with a focus on oil and gas, power, and renewable energy from a foreign investment perspective. We have endeavoured to state China's energy regulation and practice on the basis of the materials available to us as of March 2018.

II REGULATORY REGIME

In March 2018, a grand government restructuring plan was submitted and approved at the 13th National People's Congress meeting, which reshuffled the set-up and functions of various ministries and commissions at the State Council (the March 2018 Restructuring Plan). It is expected that similar restructuring will be rolled out to local government in due course. The implementation details of the restructuring plan, such as steps and transition arrangements, are currently not available in the public domain. In this chapter, we will refer to the regulatory bodies and their roles immediately prior to this restructuring, and note any intended shift as set out in the restructuring plan as applicable.

¹ Monica Sun is a partner and James Zhang is a senior associate at Herbert Smith Freehills LLP.

i Regulators

Oil and gas

The Ministry of Land and Resources (MLR)² is responsible for the supervision and administration of the exploration and exploitation of mineral resources throughout China. It has the authority to grant the licences required for the exploration and production of crude oil and natural gas in China. It also plays a role in examination and approval of blocks open to private and foreign investment.

The National Development and Reform Commission (NDRC) is in charge of setting out and implementing policies in respect of the oil and gas sector. It is also responsible for approving certain investment projects. The National Energy Administration (NEA) is established under the NDRC, with broad duties ranging from drafting energy strategies, proposing reform advice, implementing the management of energy sectors to overseeing overall development plans (ODP) for individual oil projects, or for oil and gas projects.

The Ministry of Commerce (MOFCOM) was previously in charge of review and approval of making, and amendments of, all production sharing contracts (PSCs). This approval is no longer required, and has been replaced with a record filing requirement at MOFCOM.

Power

The NDRC also has the authority to approve certain investment projects in the power industry.

The Market Regulatory Department of the NEA (which took over from the State Electricity Regulatory Commission) regulates the power industry. It is responsible for the enactment and enforcement of regulations in this industry, and also for granting power business permits to power companies.

Other regulators

Other regulators include:

- a* the Ministry of Environmental Protection (MEP):³ in charge of administering and enforcing environmental protection matters in China;
- b* the National Nuclear Safety Administration⁴: an authority under the MEP that acts as the central government agency responsible for regulating nuclear safety, supervising all civilian nuclear infrastructure in China. It also inspects nuclear safety activities and regulates the approval mechanism; and
- c* the State Administration of Work Safety:⁵ responsible for overseeing and administering work safety nationwide.

2 According to the March 2018 Restructuring Plan, the Ministry of Land and Resources will be dissolved and its functions will be taken over by the newly established Ministry of Natural Resources.

3 According to the March 2018 Restructuring Plan, the Ministry of Environmental Protection will be dissolved and its functions will be taken over by the newly established Ministry of Ecological Environment.

4 According to the March 2018 Restructuring Plan, the National Nuclear Safety Administration will be shifted to be under the newly established Ministry of Ecological Environment.

5 According to the March 2018 Restructuring Plan, the State Administration of Work Safety will be dissolved and its functions will be taken over by the newly established Ministry of Emergency.

ii Laws and regulations

China has many laws and regulations governing its energy sector, including the following.

Oil and gas

- a* The Mineral Resources Law (1986, amended 1996 and 2009) and its Implementation Rules (1994) establish the basic legal framework under which exploration and production activities (including oil and gas development) are to be carried out.
- b* The Oil and Natural Gas Pipeline Protection Law (2010) provides for the security requirements for the construction and operation of pipelines.
- c* The Regulation on Registration of Exploitation of Mineral Resources (1998, amended 2014) provides detailed requirements on the registration of mineral resources exploitation and the issuance of exploitation licences.
- d* The Measures for the Administration of Transfer of Mineral Exploration Rights and Exploitation Rights (1998, amended 2014) regulate the transfer of exploration rights and exploitation rights.
- e* The Regulation on Sino-foreign Cooperation in the Exploitation of Onshore Petroleum Resources (1993, amended 2001, 2007, 2011 and 2013) is the basis for foreign companies to participate in the exploration and exploitation of onshore blocks in China through PSCs.
- f* The Regulation on Sino-foreign Cooperation in the Exploitation of Offshore Petroleum Resources (1982, amended 2001, 2011 and 2013) is the basis for foreign companies to participate in the exploration and exploitation of offshore blocks in China through PSCs.
- g* The Measures for Regulation of Fair and Open Access to Oil and Gas Pipeline Facilities (for Trial Implementation) (2014) (Third-party Access Measures) provide the third-party access regime, allowing third parties to use the surplus capacity of pipeline facilities.
- h* The Measures for the Administration of Natural Gas Pipeline Transportation Prices (for Trial Implementation) (2016) provide that the pipeline transportation price is determined by the price administration department under the State Council following the principle of ‘allowed cost plus reasonable profits’.
- i* The Measures for the Supervision and Review of Natural Gas Pipeline Transportation Pricing Costs (for Trial Implementation) (2016) provide that the price administration department under the State Council shall be in charge of the supervision and review of pipeline transportation pricing cost following the principle of legality, the principle of relevance and the principle of rationality.
- j* The Guiding Opinions on Strengthening Regulations over the Gas Distribution Price (2017) provide that gas distribution price shall be determined and reviewed separately, following the principle of ‘allowed cost plus reasonable profits’.
- k* The Opinions regarding Further Reform of Oil and Gas Regime (2017). This ‘Opinions’ document was issued by CCP Central Committee and the State Council, and was long expected to set out roadmap for next phase reform in the oil and gas sectors. However, the full text of the document is not yet available in the public domain.

Power

- a* The Electric Power Law (1996, amended 2009 and 2015) is the main legislation governing the electricity sector.
- b* The Circular on the Reform Plan for Power Prices (2003) sets out the targets for the power price reform and is followed by the Regulation on Feed-in Tariffs (2005), the Regulation on Power Sales Price (2005) and the Regulation on Transmission and Distribution Price (2005).
- c* The NDRC Notice on Pilot Reform of Transmission Tariff in Shenzhen (2014) and NDRC Notice on Further Reform of Transmission Tariff following the Zhongfa [2015] No. 9 Document (2015) regulate the ongoing transmission tariff reform.
- d* The Regulations on Electricity Regulation were issued in 2005 to strengthen and improve electricity regulation, focusing on maintaining the order of electricity markets and promoting the development of the electric power industry.
- e* The Administrative Regulations on Permits for the Power Industry (2005) focus on maintaining the order of the electricity markets and promoting the development of the electric power industry.
- f* The Opinions regarding Further Reform of the Electric Power Regime (2015) set out the plan for further reform.
- g* The NDRC and NEA Circular on Issuing Supporting Documents for Electric Power System Reforms (2015) provides implementation measures for the reform of the power regime.
- h* The NDRC and NEA Circular on Issuing Administrative Measures on Electricity Companies' Entrance and Exit and Administrative Measures on Orderly Derestricting the Electricity Distribution Network Business (2016) provide opportunities for social capital to enter into the electricity distribution industry.
- i* The NDRC and NEA Circular on Orderly Derestricting the Power Generation and Consumption Plans (2017) provides plans for promoting electricity traded through market-based transactions.

In addition, there are numerous regulations and rules enacted by various administrative authorities, to define specific procedures or particular issues with respect to the electricity sector under the framework of the main law and regulations.

Renewables

- a* The Energy Conservation Law (2008, amended 2016) is aimed at promoting energy conservation.
- b* The Renewable Energy Law (2010) sets general principles on renewable energy.
- c* The NEA Notice on Facilitating the Development of Geothermal Power (2013) is aimed at promoting the development and utilisation of geothermal power.
- d* The NDRC Notice on Adjustment of Feed-in Tariffs for Onshore Wind Power and Photovoltaic Power Generation Projects (2017) provides for the feed-in tariff for onshore and offshore wind farms and solar energy projects.
- e* The Administrative Regulation on Guaranteed Purchase of Renewable Energy-generated Power in Full Amount (2016) sets out detailed rules to guarantee the purchase of renewable energy generated power (excluding hydropower).

- f* The Rules for Issuance and Voluntary Subscription of Green Power Certificate (for Trial Implementation) (2017) provide for the regime of issuing and free trading of Green Power Certificates.
- g* The NDRC Notice on the Program for the Establishment of a National Carbon Emissions Trading Market (Power Generation Industry) (2017) sets out detailed plans for promoting the establishment of a national carbon emissions trading market based on the current regional carbon trading pilots regime.

iii Regulated activities

Oil and gas

As mentioned above, exploration and production activities are subject to exploration and exploitation licences issued by the MLR.

In upstream oil and gas exploration and exploitation, foreign companies should partner with and enter into PSCs with legally designated national oil companies (for details, see Section II.iv, below).

Pipeline design and construction are subject to review based on criteria related to safety, environmental protection, optimal land use and economic feasibility. The construction of oil and gas pipeline networks must be approved by the NDRC or its local branches. The qualifications of the enterprises and personnel engaged in the design, installation, use and inspection of pipelines must be accredited by the General Administration for Quality Supervision, Inspection and Quarantine⁶ or its local counterpart as the case may be.

A specific business permit is required to engage in crude oil storage or trading; or refined oil wholesale, retail or storage.

Power

Power companies are required to obtain electric power business permits issued by the NEA. Electric power business permits are divided into three categories depending on the type of business:

- a* a power generation permit for power generation companies;
- b* a power transmission permit for power transmission companies; and
- c* a power supply permit for power supply companies (power supply business is defined to cover both distribution and sale of power).

A company applying for an electric power business licences must demonstrate that it has the financial capability and personnel with the required experience. In addition, power companies must obtain approval for each specific power project from relevant authorities and comply with environmental regulations to be issued with the electric power business licence.

Through an NEA notice issued in April 2014 and further amended in December 2016, the following type of generation projects enjoy a general exemption to apply for a power generation licence:

- a* distributed generation projects registered or approved by the NEA;
- b* small hydropower stations with single-station generating capacity below 6MW;

⁶ According to the March 2018 Restructuring Plan, the General Administration for Quality Supervision, Inspection and Quarantine will be dissolved and its functions will be taken over by the newly established General Administration for Market Regulatory.

- c* new-energy generation projects such as solar, wind, biomass, ocean power and geothermal power with generating capacity below 6MW;
- d* power projects with comprehensive use of heat and pressure by-products; and
- e* captive power plants without direct combustion of fossil fuel and that are dispatched by dispatching organisations at city level or below.

iv Ownership and market access restrictions

Oil and gas

The state has ownership over all mineral resources within the territory of China. Pursuant to the Mineral Resources Law, a licensing regime has been adopted and the MLR has the authority to grant exploration licences and production licences. Applicants for exploration licences or exploitation licences must be approved by the State Council to engage in oil and gas exploration and production activities. The approved companies are national oil companies (NOCs) and include China National Petroleum Corporation (CNPC), China Petrochemical Corporation (Sinopec) and China National Offshore Oil Corporation (CNOOC). However, the state has been piloting energy reform in Xinjiang province since November 2016, which includes reducing market access restriction. In particular under the pilot programme, the state further encourages diversified entities to enter into oil and gas exploration and production activities. In early 2018, a private-controlled listed company successfully bid for exploration rights of Wensu Block in Tarim Basin, Xinjiang province.

Foreign companies can partner with designated Chinese oil companies (usually CNPC, Sinopec or CNOOC) through the PSC regime to invest in onshore and offshore exploration and production in China.

Regarding unconventional oil and gas, exploration and exploitation of coalbed gas generally follows the regime for conventional oil and gas – exploration licences and exploitation licences are granted to designated companies and foreign companies can invest through the PSC regime. There is, however, more flexibility in shale gas for foreign investors. Under the current regime, foreign companies can either partner with Chinese companies holding an exploration licence of a shale gas block under a PSC, or establish a joint venture with a Chinese partner to bid for the licences directly. Owing to the continuing efforts of de-regulation as explained below, future opportunities are expected to be available for wholly owned foreign companies.

The Foreign Investment Industrial Guidance Catalogue issued jointly by the NDRC and MOFCOM sets out encouraged, restricted and prohibited activities and sectors. The latest version was issued in 2017 (the 2017 Catalogue). Any activity or sector not included in the Catalogue is permitted. Projects that are ‘encouraged’ benefit from simpler approval procedures and customs and tax incentives. ‘Restricted’ activities and sectors must generally be approved at higher levels of government, which means that approvals can be harder to obtain.

Oil and gas exploration and production are ‘encouraged’ activities in the 2017 Catalogue. Other than specific types of unconventional resources (namely oil shale, oil sands and shale gas), upstream oil and gas requires sino-foreign joint venture or cooperation. A PSC is a well-recognised type of ‘cooperation’ for this purpose. Specific unconventional resources are now, strictly speaking, open to wholly foreign owned investors; however, in most recent shale gas bidding rounds (MLR second tender in 2012 and Guizhou tender in 2017), the tender still required sino-foreign joint venture to bid.

The midstream oil and gas industry, however, is dominated by NOCs. CNPC controls nearly all the long-distance pipelines in China, including the West-East Pipelines. The CNPC website states that the CNPC owns and controls 70 per cent of the nation's crude oil pipeline and 76 per cent natural gas pipelines by the end of 2016. In December 2015, CNPC consolidated a sprawl of pipeline operations in a single company with a registered capital of 80 billion yuan, aiming to improve efficiency and boost the value of the businesses. It is considered a step towards potential divestment in future, as well as a prologue to the government's bigger plan to reform the energy regime in China, including to strip oil companies of their pipeline assets and set up an independent national pipeline company or regional pipeline companies that would own and operate oil and gas pipelines.

Construction of new imported LNG receiving terminals of capacity of 3 million tonnes and above is subject to central government approval. Most of the LNG terminals are owned and operated by the three NOCs (i.e., CNOOC, CNPC and Sinopec). In recent years, private entities as well as foreign entities have started to participate in this sector as well. As of February 2018, there are three small-scale LNG terminals in operation that have been established by private investment, and several in construction. See Section III.ii, below, for details of third-party access to infrastructure.

The downstream oil and gas sector is still dominated by NOCs. Sinopec has focused on downstream activities, such as refining and distribution, with these sectors making up over 70 per cent of the company's revenues in recent years.

Power

The main market players in the power industry include power companies (among which the five large state-owned generators are China Huaneng Group, China Datang Corporation, China Huadian Corporation, State Energy Investment Corporation (through the recent merger of China Guodian Corporation and China Shenhua Group) and State Power Investment Corporation (through the recent merger of China Power Investment and State Nuclear Power Technology Corporation), two grid companies (namely, State Grid Corporation of China and China Southern Power Grid Co.) and companies engaged in power engineering and construction business (such as China Energy Engineering Group Co. and Power Construction Corporation of China).

The main opportunities for foreign investors in the power industry lie in the construction and operation of power stations with certain technologies and renewable energy. Specifically, the following types of business in the power industry are 'encouraged' in the 2017 Catalogue:

- a* construction and operation of ultra-supercritical power stations with single unit power of 600,000kW or more;
- b* construction and operation of power stations for heat-power co-generation units of back-pressure (extraction-back) type, heat-power-cool multi-generation units, and heat-power co-generation units of 300,000kW or more;
- c* construction and operation of power stations with large air-cooled generation units with single unit power of 600,000kW or more in regions suffering from water shortage;
- d* construction and operation of projects of power generation via integrated gasification combined cycle and other clean coal power generation projects;
- e* construction and operation of power generation projects with single unit power of 300,000kW or more that use fluidised bed boilers and coal gangue, middling, and coal slurry;

- f* construction and operation of hydropower stations for the primary purpose of power generation;
- g* construction and operation of nuclear power stations (the Chinese party must hold a controlling interest);
- h* construction and operation of new-energy power stations (including solar energy, wind energy, geothermal energy, tidal energy, wave energy and biomass energy); and
- i* construction and operation of a power grid (the Chinese party must hold a controlling interest). This was previously a 'restricted' item under the 2011 Catalogue.

It is worth noting that, although they are not specifically addressed in the 2017 Catalogue, the following types of projects are generally restricted, which applies to all (foreign or domestic) investors, pursuant to Interim Provisions on Construction Management of Small Thermal Power Units (1997) and the NDRC Guiding Catalogue for Industrial Structure Adjustments (2011):

- a* power plants utilising coal-fired and steam condensation thermal generator sets whose single generator capacity is 300,000kW or less and connected to small grids;
- b* thermoelectric power stations utilising coal-fired steam condensation and extraction thermal generator sets whose single generator capacity is 100,000kW or less and connected to small grids; and
- c* the above types of power plants (in the case of thermoelectric power stations, the capacity threshold is 200,000kW) connected to large grids.

v Transfers of control and assignments

The transfer of exploration rights and exploitation rights for mineral resources (including oil and gas) is allowed provided that the following conditions are met:

- a* two full years have passed since the issue of the exploration licence, or the discovery of the mineral resources available for further exploration or exploitation in the exploration zone; or one full year has passed since the exploitation enterprise began exploitation;
- b* the specified minimum input for exploration has been fulfilled;
- c* no disputes have arisen regarding the ownership of the exploration rights and exploitation rights;
- d* the exploration right usage fees, exploitation fees or any price for the exploration and exploitation rights have been paid; and
- e* a transferee of mineral exploration rights or exploitation rights should meet the qualifications of a mineral exploration right applicant or exploitation right applicant prescribed in the Measures for Area Registration Administration of Mineral Resources Exploration and Survey or the Measures for the Registration Administration of Mineral Resources Exploitation.

The MLR will decide whether to approve the transfer within 40 days of receipt of the application. The transfer will take effect as of the day of approval.

As mentioned above, in most cases, the rights for exploration and exploitation of oil and gas are held by the three NOCs, with whom the foreign investors would enter into a PSC. There is no regulatory requirement for transfer of participating interest under a PSC. Previously, any amendments to the PSC were required to be approved by MOFCOM. This requirement was abolished in 2013 and now only record filing with MOFCOM is required. In practice, Chinese PSCs often provide that the consent of a foreign investor is required if

the NOCs propose to take over the production operations before foreign contractors' full recovery of the development costs. After the full recovery of the development costs incurred in accordance with the ODP of any oil or gas field within the contract area, the NOCs may, at any time, have the right to take over the production operations by giving a written notice to the foreign contractor.

Transfer of power generation units in operation requires a change to the power business licence, which needs to be approved by the NEA. The NEA will review if the requirements for granting the relevant licences are still satisfied.

III TRANSMISSION/TRANSPORTATION AND DISTRIBUTION SERVICES

i Vertical integration and unbundling

The State Grid and China Southern Grid control the electricity transmission and distribution networks in China, and are used to monopolise the supply of electricity by purchasing power from power generators at regulated feed-in tariff, and sell power at the regulated power sales prices.

The ongoing power price reform, however, aims to separate the sale of power from grid companies. The Opinions regarding Further Reform of the Electric Power Regime (2015) and the NDRC and NEA Circular on Issuing Supporting Documents for Electric Power System Reforms (2015) provide that power generators will enter into agreements directly with retailers or users with term contracts or spot trades, with the power price being freely negotiated between the parties. The transmission and distribution tariff will be regulated by the government on a 'cost plus reasonable profits' basis. According to the Notice by the NDRC regarding Comprehensive Promotion of Pilot Reform of Transmission and Distribution Tariff (2016), this reform is now carried out in most provinces.

Since 2009, the user-generator direct trading system has been put on trial in more than 20 provinces. Companies with high electricity consumption (such as aluminium electrolysis and steel plants) can purchase electricity directly from generators. The price paid by such consumers is composed of the power purchase price negotiated between the generator and the consumer (under a power purchase contract), the transmission and distribution price paid to the grid company (under a service contract) and government surcharges. The Opinions regarding Further Reform of the Electric Power Regime (2015) also set out further goals for the development of this user-generator direct trading system.

ii Transmission/transportation and distribution access

Oil and gas

China established the third-party access scheme in the Third-party Access Measures for a trial period of five years. In addition, The Regulation on Construction and Operation of Natural Gas Infrastructure (2014) encourages investment into natural gas facilities.

Under the Third-party Access Measures, pipeline and facility operators should grant third parties access to pipeline networks and associated facilities if operators have surplus capacity and, in the case of multiple third-party users, non-discrimination principles should apply, but priority should be given to contracts already in place. The facilities to be opened to third parties include not only trunk pipelines and branch pipelines for crude oil, refined oil and natural gas, but also the relevant associated facilities including ports, receiving terminals, and liquefaction, compression and storage facilities.

Power

A grid operator must ensure non-discriminatory and fair access of its grid to qualified power plants and disclose the following information to power plants within its network:

- a* grid structure and line layouts;
- b* amount and status of transformation facilities;
- c* total installed capacity;
- d* power supply and demand and transmission capacity of major lines and outgoing lines; and
- e* tariffs and prices for inter-provincial power transactions and direct trading.

An interconnection agreement will be entered into by the grid operator and the power generator, specifying terms and conditions including capacity and feed-in tariff.

Grid companies must ensure non-discriminatory and fair access to their grid to qualified power plants.

For renewable power generation (RPG) enterprises, the grid operators are required to:

- a* build and manage the interconnection system for qualified RPG projects;
- b* enter into grid connection agreements with qualified RPG enterprises; and
- c* purchase all the on-grid power generated by these RPG projects at a higher feed-in tariff.

iii Rates

Oil and gas

According to Measures for the Administration of Natural Gas Pipeline Transportation Prices (for Trial Implementation) (2016) and Measures for the Supervision and Review of Natural Gas Pipeline Transportation Pricing Costs (for Trial Implementation) (2016), inter-provincial pipeline transportation tariffs are regulated by the NDRC on the ‘allowed cost plus reasonable profits’ basis. The NDRC completed the costs assessment of 13 interprovincial pipeline systems in August 2017 and published reduced tariffs effective from September 2017. Intra-province pipeline transportation tariffs are regulated by local development and reform commission and are reported to the NDRC annually.

According to the NDRC Circular on Issuing the Guiding Opinions on Strengthening Regulations over the Gas Distribution Price (2017), gas distribution price shall be determined and reviewed separately, following the principle of ‘allowed cost plus reasonable profits’. This marks a further big step by the state to achieve the goal of ‘regulating middle while liberalising the front and end’.

Power

In theory, the rates that the grid companies charge end users seek to recover power purchase costs and fees for transportation, distribution and sale services, power losses and the like. However, in practice, the rates are set by the government and vary depending on the type of user and the region.

iv Security and technology restrictions

Oil and gas pipeline owners and operators have obligations under the Oil and Natural Gas Pipeline Protection Law, including those to patrol, inspect and maintain the pipelines; to

upgrade, transform or stop using those pipelines that do not satisfy the safe use requirements in a timely manner; to post, repair or change signs related to the pipeline; and to take effective safety protection measures for a pipeline not in operation.

As gas pipelines are considered to be 'specialised equipment' under the specialised equipment regulatory regime, a pipeline operator is required to hold a Specialised Equipment Registration Certificate. In addition, both natural gas and gas pipelines are considered to be 'hazardous material' under the hazardous material regulatory regime. The 'producer' of hazardous material is required to hold a Production Safety Permit and the 'trader' of hazardous material is required to hold a Hazardous Material Operation Permit. However, it is not clear whether the pipeline owner and operators will be considered producer or trader of hazardous material.

Power grid operators also have security obligations under the Electricity Law. The power grids shall be operated in accordance with the principles of safety, high quality and economy. Power grid operations must be maintained in an uninterrupted and stable way, with a stable supply of electricity guaranteed.

IV ENERGY MARKETS

i Development of energy markets

The price of refined oil products is regulated by the NDRC. Gas (including LNG) price used to be heavily regulated by the NDRC, but there has been a steady progress of deregulation. According to an NDRC press release, as of October 2017, the price for 50 per cent of all gas consumption in China is completely deregulated, and 30 per cent is regulated on base-price basis. The remaining 20 per cent is for residential use and the price for this portion is still regulated.

In August 2016, the State Council clearly pointed out in its notice regarding lowering real economic business costs, one of the essential plans is to liberalise the prices in competitive sections (in particular, to speed up market-oriented reform in oil and natural gas). In addition, in the Opinions regarding Further Reform of Oil and Gas Regime (2017), the CCP Central Committee and the State Council further instruct on the market-oriented reform in oil and natural gas, and more supporting policies are expected to be issued in 2018.

As mentioned above, under the current regime, grid companies purchase power from power generation companies at regulated fixed prices and sell power to the customers at regulated fixed prices. Generation is dispatched on a fair and equal basis.

Under the ongoing power price reform, the Chinese government is exploring the possibility of opening up electricity markets. The aim at this stage is to establish a mid-to-long-term market and a spot market.

ii Energy market rules and regulation

Oil and gas

To engage in crude oil storage or trading, or refined oil wholesale or retail, a specific business permit issued by MOFCOM is required. There are certain requirements for applicants to obtain a business permit, including a certain amount of registered capital, long-term supply agreements, and stable sales channels and facilities. Foreign-invested enterprises may also apply for permits.

State trading enterprises and non-state trading enterprises may engage in the importation of crude oil and refined oil. MOFCOM publishes a list of state trading enterprises, and companies outside that list may become a non-state trading enterprise if they:

- a* have a foreign trade business qualification;
- b* satisfy the requirements published by MOFCOM; and
- c* register with MOFCOM.

Both state trading enterprises and non-state trading enterprises must obtain an import licence issued by MOFCOM. However, non-state trading enterprises shall be subject to import quotas. This quota for the year 2018 is 142.42 million tonnes. In 2015, MOFCOM also issued a notice setting out the detailed requirements for refineries to import crude oil, including requirements regarding equipment, product quality, safety management and personnel.

Use of imported crude oil was previously limited to NOCs. In February 2015, however, the NDRC issued a notice breaking the monopoly. Local refineries can now apply to use imported crude oil if they meet certain requirements, including requirements regarding equipment, product quality and safety management. Thirty-two refineries have obtained a permit from the NDRC to use imported crude oil as of December 2017.

There is no market entry restriction on the import or export of gas or LNG.

In addition, trading of oil and gas requires safety permits under, for example, the hazardous material regulatory regime.

Power

Sale of power to customers has been largely controlled by the State Grid and China Southern Grid through their subsidiaries. Under the power sector reform, however, we expect to see more participants in the market. Apart from the user-generator direct trading system, the NDRC and NEA Circular on Issuing Supporting Documents for Electric Power System Reforms (2015) also allows independent power supply companies to participate in the market provided that certain conditions, including on total assets, equipment and expertise, and the electric power business licence issued by NEA, are met.

iii Contracts for sale of energy

Oil and gas

There are two types of government regulated prices:

- a* government fixed price; and
- b* government guidance price.

The former is fixed and there is no flexibility, while the latter is more flexible. Government guidance price can be in the form of:

- a* a benchmark price with a float range;
- b* maximum price;
- c* minimum price;
- d* the rate of price difference; and
- e* the profit rate.

When a foreign company invests in upstream oil and gas through the PSC regime, parties would normally agree in the PSC that the NOC will sell the foreign investor's share of oil

and gas on its behalf. Usually the price is determined by reference to the prevailing price in an arm's-length transaction for a long-term sales contract of similar quality of crude oil in the main world oil markets with adjustment to be made for quality, delivery, transportation, payment and other terms, and expressed as 'free on board' price at the delivery point in China.

Upstream crude oil prices and gas prices are not regulated, while refined oil prices and natural gas prices at city gate are subject to government regulation:

- a* the retail and wholesale of gasoline and diesel, as well as sale of gasoline and diesel to wholesale business, railway customers and transportation customers are subject to the governmental guidance price; and
- b* the supply of gasoline and diesel for state reserves or Xinjiang Production and Construction Corps as well as the factory price of aviation gasoline are subject to government (fixed) pricing.

The price of gasoline and diesel will be adjusted every 10 business days based on international crude oil price, processing cost, taxes, transmission fees and reasonable profits.

The government provides for base price of natural gas at the city gate (which means parties may negotiate the city gate price and such price shall not exceed 120 per cent of base price) while the ex-factory price can be negotiated between parties. The prices of gas produced from shale gas, coalbed gas, coal gas and imported LNG are deregulated and can be determined by parties. The price for direct sale arrangement between CNPC/Sinopec and industrial users under 'direct supply arrangement' is also deregulated. In order to accelerate the gas price reform, the state started a pilot programme in Fujian province in November 2016, whereby the city gate prices will be determined freely based on negotiation between the supplier (CNPC) and consumers (utilities), and not subject to government regulation.

Power

To a large extent, the power prices are set by the government, taking into account the power purchasing cost, the loss from power transmission and distribution, power transmission and distribution price and government funds. The prices vary depending on a number of factors including season, peak hour, region and type of user (namely, residential user, agricultural user and industrial and commercial user).

Customers are allowed to participate in the power market if certain criteria are met, and may choose to enter into power purchase agreements with (1) power supply companies, or (2) directly with power generators. The terms and conditions of these agreements can be freely negotiated between two parties.

The Opinions regarding Further Reform of the Electric Power Regime (2015) and the NDRC and NEA Circular on Issuing Supporting Documents for Electric Power System Reforms (2015) set out future steps to further facilitate the reform, including determining qualified generators based on energy conservation and environment protection requirements; expanding the direct trading to power supply companies; and encouraging long-term agreements between generators and customers.

V RENEWABLE ENERGY AND CONSERVATION

As part of government policies in response to climate change and in line with China's commitments to the international community, the State Council set an objective to

control energy consumption to 5 billion tonnes of standard coal in the 13th Five-Year Plan period (2016 to 2020). The NDRC also set Mid-to-Long Term Plans for renewable energy development: 10 per cent of the total energy consumption should be sourced from renewable energy by 2010, and 15 per cent by 2020. The midterm target (10 per cent by 2010) has been achieved. In July 2017, the NEA issued Guidelines of the National Energy Administration on the Implementation of the 13th Five-Year Development Plan for Renewable Energy, listing the overall development plan for wind power, biomass and solar plants for 2017–2020.

In addition, the Chinese government has established a clean development mechanism fund to support construction and industrial activities that are beneficial to strengthen proper responses to climate change since 2010. The construction and operation of power stations using renewable energy is ‘encouraged’ under the 2017 Catalogue.

Under the current power regime, the government sets higher feed-in tariffs (FITs) to encourage power generation from renewable energy. The table below sets out the feed-in tariffs for wind, biomass and solar power.

| Electricity source | FITs |
|--------------------|--|
| Wind | Onshore project: four tiers ranging from 0.4 yuan/kWh to 0.57 yuan/kWh, depending on project locations (for projects approved after 1 January 2018 and projects approved before 1 January 2018 but not in construction at the end of 2019). Offshore projects: 0.85 yuan/kWh or 0.75 yuan/kWh depending on the distance to shore. |
| Biomass | 0.75 yuan/kWh. |
| Solar | Three tiers ranging from 0.65 yuan/kWh to 0.85 yuan/kWh, depending on project locations, for projects initiating operation from January 2017. For projects initiating operation from January 2018, the FITs range from 0.55 yuan/kWh to 0.75 yuan/kWh. |

Other incentives include:

- a* surcharges collected from end users, which are used to subsidise the difference between feed-in tariffs and the benchmark price for desulfurised coal generators, operations and maintenance for independent public power systems, and costs for connecting renewable energy generators to power grids;
- b* favourable loans with financial discounts for renewable energy projects listed in the guidance catalogue for renewable energy industry development;
- c* subsidies for renewable energy development in areas such as new-energy vehicles, building-integrated solar photovoltaic systems, wind turbines and biomass power generation; and
- d* tax incentives.

Also, the NDRC approved a nuclear project in March 2015 marking the official relaunch of nuclear projects in China. The Mid-to-Long Development Plan of Nuclear Power by the State Council sets the target for nuclear power at installed capacity of 58 million kW and 30 million kW under construction by 2020, which means a shortfall of 39 million kW. The industry is expecting a large wave of investment into nuclear power in the near future. In March 2016, Shenhua, China’s largest coal producer (now part of the State Energy Investment Corporation) was reported to be in talks with leading Chinese nuclear developers China National Nuclear Corporation and China General Nuclear Power Corporation on taking stakes in domestic nuclear projects, as part of its efforts to diversify into cleaner forms of energy. Despite the NEA’s earlier plan to promote eight new projects in 2017, no new nuclear projects were actually approved by the State Council during 2016 and 2017.

In order to help reduce government subsidies to the renewables sector, the NDRC, together with the Ministry of Finance and the NEA, issued a Circular on the Trial Implementation of the Renewable Energy Green Power Certificate Issuance and Voluntary Subscription Transaction System (the Green Power Certificate Circular) in January 2017. According to the Green Power Certificate Circular, solar and wind power producers would apply for and be issued tradeable certificates for the renewable electricity generated by them. End users are encouraged to buy such certificates at an agreed price through negotiation or a bidding process. Solar and wind power producers will not receive a direct subsidy (higher FITs) for the electricity corresponding to the certificates sold. The NDRC indicated that the state may launch a mandatory green certificate scheme in 2018. In July 2017, an official website for trading of the Green Power Certificate was launched. As of October 2017, while over 8 million certificates were issued, only around 20,000 certificates were traded.

Also aiming to promote clean energy, a carbon emissions trading system has been operated on a pilot basis in parallel. In December 2017, the NDRC announced the plan to roll it out to the national level. The interaction and reconciliation between the green certificate regime and the carbon emissions trading system are to be further observed in the future.

VI THE YEAR IN REVIEW

In February 2017, the State Council released the 13th Five Year Plan for Energy Development (2016 to 2020), listing future energy strategies for an efficient, clean and safe energy system. According to the Plan, the annual primary energy consumption will be capped at an amount equivalent to 5 billion tonnes of standard coal by 2020. The Plan sets goals on future energy structure, with at least 15 per cent of energy supplied from non-fossil fuels, 20 per cent supplied from natural gas and at most 58 per cent from coal by 2020.

China also continues towards achieving the marketisation of its energy supply. Gas price deregulation is the most advanced in progress compared to other subsectors. As of October 2017, the price for 50 per cent of all gas consumption in China is completely deregulated, and 30 per cent is soft-regulated on base-price basis. The remaining 20 per cent are for residential use and only the price for this portion is still regulated. Meanwhile, reform on gas pipeline infrastructures (most notably the third-party access regulations and tariff regulations) secures the foundations of large-scale trading to be emerged. Shanghai Petroleum and Natural Gas Exchange started commercial operation in November 2016, and a second exchange of similar nature was launched in Chongqing in January 2017 and is expected to start trading in early 2018. The deregulation of gas price coincides with a jump in gas demand. In 2017, the total gas consumption increased 15.3 per cent from 2016, to 237.3 billion cubic meters. This shooting demand, coupled with an insufficient capacity of gas storage and LNG importation infrastructure, caused a severe gas shortage during winter 2017–2018 in China, which pushed up the entire northern Asia LNG spot market. The gas shortage has drawn further attention to the need of further development of, and third-party access to, gas infrastructures.

In 2017, the Chinese coal mine industry continued to focus on reducing excessive industrial capacity by closing small local coal mine companies and reorganising big coal mine SOEs. The NDRC also emphasised that its goal in the near future is to promote industry

upgrading and transformation by reorganising big coal mine SOEs. Such an industry goal is consistent with the 13th Five Year Plan for Energy Development (2016 to 2020), pursuing a more efficient, clean and safe energy system in China.

The year 2017 also saw major players in the power sector consolidating, underscored by the Chinese government's grand plan to improve the efficiency and competitiveness of SOEs. Most notably, Shenhua and Guodian merged into the State Energy Investment Corporation, creating a giant with the largest amount of coal-fire installed capacity and the largest renewable installed capacity in the world. China Power Investment and SNPTC merged into the State Power Investment Corporation, becoming the only energy group in China operating all types of hydro, coal-fire, nuclear and renewable power plants. On the nuclear side, China National Nuclear Corporation (CNNC) acquired and absorbed China Nuclear Engineering and Construction Group Corporation (CNECC), consolidating the resources to push forward with the going-out of China's nuclear technology.

VII CONCLUSIONS AND OUTLOOK

The regulatory environment is changing fast in China, and the energy sector is no exception. Both the economic restructuring plan and the development of green-energy technology have had a profound influence on the energy industry. Various stakeholders and their demands contribute to innovation in the industry, while also adding complexity to the reform process. With reforms taking place in the regulatory regime and the restructuring of the market ongoing, it is vital to keep a close eye on energy regulations in China.

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