Energy Governance in China: The Structures and Processes of Government Decision-Making

**Dongmei Chen, Paul Mollet and
Brian Efirid**

May2019

Doi: 10.30573/KS--2019-DP56

About KAPSARC

The King Abdullah Petroleum Studies and Research Center (KAPSARC) is a non-profit global institution dedicated to independent research into energy economics, policy, technology and the environment across all types of energy. KAPSARC's mandate is to advance the understanding of energy challenges and opportunities facing the world today and tomorrow, through unbiased, independent, and high-caliber research for the benefit of society. KAPSARC is located in Riyadh, Saudi Arabia.

Legal Notice

© Copyright 2019 King Abdullah Petroleum Studies and Research Center (KAPSARC). No portion of this document may be reproduced or utilized without the proper attribution to KAPSARC.

Introduction

This paper describes the current governance structure of China's energy sector, with a brief description of the historical legacy that underlies this structure. The interplay between the central government, the Communist Party, regional governments and key economic actors within the framework of the five-year planning processes are complex and constantly evolving. As such, the structure and processes for energy governance are similarly complex. The oversight and process for governing China's energy sector will change as the country transitions from an emerging to a mature economy.

This paper provides an overview of how key decisions in the energy sector are made, implemented and monitored. The aim is to provide insights for those outside China who wish to better understand Chinese energy governance. The structures and processes outlined in this paper will inevitably continue to evolve and change as China learns to differentiate between effective and ineffective governance approaches. While this paper provides a comprehensive snapshot of China's energy governance at the time of publication, it is expected to continue evolving.

Summary

This paper provides a snapshot of China's energy governance as the country is consolidating its policy and decision-making processes. The intended audience is anyone interested in China's energy sector and its governance structure, whether policymakers, researchers and academics, diplomats, or corporations wishing to invest in the country.

China has put in place a complex governance system to ensure that the availability of energy does not constrain the government's ambitious growth targets. As China is entering a 'new normal' with respect to its economic expansion, it has applied changes to the governance of its energy sector. Key amendments to China's constitution and the creation of new ministries approved at the 13th National People's Congress (NPC) in March 2018 will have a long-term impact on the political system in China, including on energy governance.

China's strategic energy policymaking has been heavily centralized within the country's top leadership, but its policy formulation involves a wide range of players within the pyramid system that characterizes decision-making in China. Many ministries and administrations with different, and sometimes competing, economic and social functions all play a role at key stages in the energy policy chain, resulting in the increasingly fragmented nature of energy governance. The political dynamics between central government and the provinces have further shaped the energy policymaking process and its results. Inevitably, the multiplicity of central and regional government administrations has led to conflicts of opinion, competing interests and overlapping responsibilities. In addition, a new focus on environmental issues, notably those related to

urban air quality and climate change, has added an extra layer of complexity to the energy governance debate.

The country's leadership is acutely aware of the need to improve coordination and accountability in order to address the issues associated with effective policy formulation. This can be seen in recent changes, including the creation of the Ministry of Ecology and Environment (MEE) that replaced the Ministry of Environmental Protection. MEE was given enhanced powers over issues related to climate change and the energy sector. The NPC now plays a major role in passing laws promoting China's energy transition.

As China enacts increasingly ambitious market reforms, energy pricing mechanisms – raw material, energy services and logistics prices – have become crucial in developing the country's energy market. This paper explores the mechanisms used to regulate energy markets where natural monopolies proliferate and state-owned enterprises own most of China's critical energy infrastructure.

In recent years, China has gradually relaxed its energy investment approval regime as part of a wider process of opening up its economy. Devolving energy project approvals from central government to the provincial level has facilitated investments in a diversified energy portfolio. However, the continued overcapacity of coal power plants has slowed the liberalization of rules on market access. The involvement of so many government agencies, other than energy administrations, in China's energy governance structure further reduces the vitality of a sector in which investment is vital for the country's energy security.

Emerging Issues in Chinese Energy Politics

Radical constitutional amendments

On March 11, 2018, the first session of the 13th National People's Congress (NPC) of China adopted the most radical constitutional amendments in decades. Amendments included describing the leadership role of the Communist Party of China (CPC) as the most fundamental characteristic of Chinese socialism. The amendments are intended to dispel any lingering doubts over the constitutional legitimacy of one-party rule and include a clause to establish the National Supervisory Commission (NSC). This new commission will merge several governmental and prosecutorial anti-graft departments with the Central Commission for Discipline Inspection, as well as the Ministry of Supervision. A new supervision law detailing how the commission will operate to fight corruption was adopted two weeks after the NPC meeting.

The removal of presidential term limits by the NPC caught the world's attention. The official Chinese news outlet, the People's Daily, commented that this amendment did not imply lifetime tenure for any leader. China implemented it for the sake of its sustainable development, which relies on upholding strong party leadership and firmly following the leadership of the party's Central Committee, with Xi Jinping at its core. The Western belief that the separation of executive, legislative and judicial powers is the foundation of a well-functioning political system contrasts with China's centralized model of government. The growing differences in political ideology between the East and West have contributed to deteriorating relations between China and major industrialized

countries, including on trade and economic issues. However, much of the West's concern over China appears to be related to the latter's high-tech industrial development and outbound investment. There is also some mistrust from the West of China's highly integrated one-party state system and the way it organizes its industrial market.

Reform of government administration

The Chinese government also announced a major reorganization of its ministries at a session of the 13th NPC, intended to make the government more structured, efficient and service-orientated. This reorganization reduced the number of ministries from 34 to 26, consolidating existing functions and establishing new bodies. These changes will have profound implications for China's priorities and how it interacts with the world.

The new Ministry of Ecology and Environment (MEE) replaced the previous Ministry of Environmental Protection (MEP) and absorbed a variety of pollution monitoring and reduction roles previously assigned to other ministries. These included responsibility for climate change and carbon emissions from the National Development and Reform Commission (NDRC), water environment from the Ministry of Water Resources (MWR), agricultural pollution from the Ministry of Agriculture (MOA), underground water pollution from the Ministry of Land and Resources (MLR), and ocean environment issues from the State Oceanic Administration (SOA). The MEE has significantly more power than its predecessor ministry and signals China's increased commitment to improving the quality of its environment.

Emerging Issues in Chinese Energy Politics

The new Ministry of Natural Resources (MNR) replaced the previous MLR, SOA and State Bureau of Surveying and Mapping and absorbed responsibility for protecting and developing forests, wetlands and grasslands from other ministries (Figure 1). The MNR is also charged with helping to boost environmental and resource protection in China.

Beijing also established the International Development Cooperation Agency to coordinate its foreign aid policies. The new agency, reporting directly to the State Council, has taken over related roles previously divided between the Ministry of

Commerce (MOFCOM) and the Ministry of Foreign Affairs (MFA). The new agency will focus on supporting the Belt and Road Initiative (BRI), which has become the defining framework for China's foreign policy.

The establishment of the National Market Supervision Administration (NMSA) may be of particular interest to foreign companies, which have often complained that antitrust investigations and penalties unfairly target them. The NMSA replaced the previous State Administration for Industry and Commerce; the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ);

Figure 1. Concentrated administration of environment and resources.

Source: KAPSARC, based on Chinese government documents.

and the State Food and Drug Administration. It also took on the responsibilities of supervising pricing and enforcing anti-monopoly policies from the NDRC and MOFCOM. Although the personnel from these agencies will be absorbed into the NMSA's framework, concentrating such broad functions into one agency risks eroding technical expertise. How it operates and its areas of emphasis will say a lot about the extent of China's promises to open its markets to the world.

The changes under the State Council are complicated by simultaneous reforms to CPC institutions. Endowing party groups, which operate more on ideology than technocratic expertise, with more authority over China's governance structure will lead to a more complicated process in drafting and approving policy decisions. It will take time to make the new party-state system fully functional and will involve a moderate level of uncertainty and administrative inactivity in the process.

The Institutional Framework of Energy Governance in China

Governance is defined as the manner in which a country exercises its power in managing its economic and social resources for development. Good governance creates and sustains an environment which fosters strong and equitable development (World Bank 1992). Even in highly market-oriented societies, only governments can provide the rules to make markets work efficiently and make corrective interventions when markets fail (McLean 1987). The institutional frameworks that support energy development in China depend on the development of markets. These frameworks are significantly affected by the transition from a highly integrated relationship between government and enterprises under a planned economy to a market-based

system. The strengthened party control over the state through a constitutional amendment is also shaping energy governance in China. As such, it is important to identify China's institutional framework and its role in energy policymaking.

A pyramid model of influence is used to inform this paper's analysis. Figure 2 shows that the prevailing institutions of the Chinese political system occupy the highest level of influence. The ministries involved in different parts of energy decision-making occupy the second level. The think tanks and industrial associations that provide technical support to government and act as a channel for public participation in energy decision-making occupy the third level.

Figure 2. Pyramid of energy governance in China.

Source: KAPSARC.

The core leadership of the CPC has a predominant role over the entire political system. There are, in essence, two parallel governance structures in China: the CPC and the formal government. The CPC exercises power over the NPC, the State Council and the military, even though the NPC is theoretically the highest state organ and operates as the main state legislature. The State Council is the highest organ of state administration and is officially responsible for implementing policies formulated by the CPC and laws adopted by the NPC. In addition, entities called CPC Leading Groups play an important role at the top of the political pyramid. The Leading Groups drive decision-making and implementation across the boundaries of party and state institutional structures for strategically important and complex issues, such as foreign relations, financial affairs and economic reforms closely related to energy development.

The commissions and ministries under the State Council are nested in distinct chains of authority. The NDRC and National Energy Administration (NEA) administer the majority of energy issues, such as investment approval, pricing, market supervision and market reform. There are another 16 ministries involved in state security, foreign relations, environmental protection and industrial competitiveness. This group of actors links the top leadership group with players on the ground, integrating their investigations with findings from research groups, local governments and related enterprises. Some studies argue that these ministries are in charge of translating the energy policy directives into concrete measures for their respective sectors rather than agenda setting (Meidan et al. 2009). But in reality, the CPC's collective decision-making system requires both top-down and bottom-up input for policymaking.

Centrally administered state-owned enterprises (SOEs) are also grouped into this middle layer

of the pyramid because of their unique role and strong weight in the Chinese political and economic system. SOEs take responsibility for preserving and increasing the value of state-owned assets and are involved as key players for national energy security and foreign relations. They also seek to maximize profits through preferential policies and performance improvements on the corporate side. Whether SOEs allow their corporate interests or the national interest to prevail is a controversial topic. Senior executives of these SOEs usually have ministerial rank and are assigned by the relevant department of CPC's Central Committee. Many of them rotate through leadership roles in central or provincial government administrations or CPC committees. Because of their professional expertise and political clout SOEs are closely involved in the policymaking process in the oil, mining, power and nuclear sectors (Downs 2004).

The third layer of the pyramid mainly comprises research centers, universities and institutes. Research entities affiliated with government departments, such as the Energy Research Institute of the NDRC and the Development Research Center of the State Council, play an active role in studying and making policy proposals. Other research entities that exist under the aegis of energy SOEs, such as the Energy Research Institute of the State Grid Corporation and the Economic Technology Research Institute of China National Petroleum Corporation (CNPC), may shape energy policymaking in specific areas that are usually inaccessible to other players and where they have strong expertise. Industrial associations that are separate from the central government administration also play important roles because of their historical links with government and their understanding of the business dynamics of their relevant sectors.

The Institutional Framework of Energy Governance in China

In addition to the three core groups already mentioned, a growing number of international non-governmental organizations (NGOs) are also involved in energy policy research and discussion through collaboration with research entities, industrial associations and the Chinese media. These NGOs include bilateral and multilateral agencies, international chambers of commerce, and international environmental organizations. For example, the China Council for International Cooperation on Environment and Development,

a high-level policy advisory body established in 1992, has built a platform for open discussion among senior figures from both China and the international community and brings global expertise on sustainable development to China. The Paulson Institute, a nonprofit think tank founded in 2011 by Henry M. Paulson, the 74th secretary of the United States (U.S.) Department of the Treasury, promotes bilateral cross-border investment and economic links between China and the U.S.

Core Leadership

The CPC

Unlike political parties in most western nations, the CPC is intertwined with all government offices, from central to village level, and with all SOEs (Andrews-Speed 2010). Most government officials and senior executives of SOEs are CPC members and are subject to the discipline of the CPC, while the People's Liberation Army (PLA) is subordinate to the party, rather than to the government or the president.

The party constitution states that the CPC has control over all aspects of Chinese society, coordinates the efforts of the country's power structure and acts as the ultimate leader of all organization in China. The CPC decides the personnel appointments for all political institutions, including the military, the judiciary, SOEs and public institutions. Its policy is communicated down through the various party layers by means of directives, party group meetings and nationwide campaigns.

The 2018 amendment to the national constitution has made the CPC's leadership role in China's political and economic system explicit, whereas in the past it was often hidden. Energy politics in China will be significantly shaped by how the CPC improves the performance of the party and exercises its power over the operation of the NPC and the State Council.

The seven-member Politburo Standing Committee (PSC) is usually the highest authority in the CPC and is the highest political decision-making body in China. Each member of the PSC concurrently serves as the leader of different parts of the policy system. These include the Central Military Commission, the State Council, the NPC, and the Chinese People's Political Consultative Conference National Committee.

Theoretically, the CPC leadership is selected through a bottom-up process. The lower-level CPC groups select delegates to the CPC National Congress, which in turn selects the CPC Central Committee. For its part, the CPC Central Committee selects the members of the Politburo and its Standing Committee, including the general secretary. The CPC leadership is endorsed for a five-year term, until the following CPC National Congress. In reality, members of the Standing Committee and Politburo are selected through complex and opaque processes in which the preceding and earlier generations of top leaders play a significant role.

The collective leadership structure in the PSC is unique to the Chinese political system. It consists of a clear division of work and related mechanisms for collective leadership transition, learning, research and decision-making (Hu 2013). Consensus building is crucial for this collective leadership system to reach decisions as, theoretically, every member has equal voting rights. It is clear that Xi Jinping is at the core of the collective leadership system and has the ultimate power to drive the direction of national policy.

Leading Groups

For several decades now, informal bodies called Leading Groups have advised the Politburo on policy development and have helped facilitate cross-agency implementation of policy decisions. With these groups in place, it is easy to siphon power from any existing party-state institutional structure to implement policies (Lance 2014). But during Xi's presidency, the Leading Groups established since 2013 have evolved as decision-making bodies for significant policy issues, rather than advising bodies. This changes energy governance significantly because energy is a major concern for many of

these Leading Groups. After the 19th CPC National Congress, which was held October 13-24, 2017, the decision-making and coordination functions of Leading Groups was further strengthened in the areas of national reform, cyber security, economic and foreign affairs. Four Leading Groups were restructured into commissions and renamed the CPC Central Comprehensively Deepening Reforms Commission, the CPC Central Cyber Security and Informatization Commission, the CPC Central Financial and Economic Commission, and the CPC Central Foreign Affairs Commission.

The CPC Leading Group for National Security and the CPC Leading Group of Foreign Affairs comprise the same membership but act as two independent entities. The former was created in 2000 while the latter was established in 1981. The two groups' membership includes officials from the Ministry of National Defense, the MOFCOM, the International Department of the CPC Central Committee, the Ministry of State Security (MSS), the Ministry of Public Security (MPS), and the offices for Hong Kong, Macau and Taiwan. This structure helps align foreign policy with state security concerns. Faced with new global economic challenges and the perceived deficiencies of the previous system, the establishment of the CPC Central National Security Commission (CNSC) in 2013 and the CPC Central Foreign Affairs Commission strengthened these two policy streams. The CNSC has the authority to coordinate and mobilize resources across the country. In addition to security issues, the CNSC now handles wider issues that affect national security, such as economic development, environmental issues, energy security, climate change, industrial security, public health, and international terrorism. It also provides support to China's diplomatic efforts, which have grown as the country establishes a greater role in regional and international affairs.

The existence of the Leading Group for Financial and Economic Affairs (LGFEA) under President Xi's presidency was first made public following the announcement of the 6th Working Group Meeting, held on June 13, 2014, to discuss energy security strategy. Although this group has informally existed since 1980, it has only been during Xi's presidency that it has been given a formal role as China's highest macroeconomic policymaking body, a major step forward from its previous role as an economic policy advisory body. The working group meetings listed in Table 1 reflect the major issues in China's recent economic history. The CPC has used this body to significantly strengthen its control over national economic issues. In recent years, the working group has built in-house capability in key areas such as economic research, economic policy design and policy review that has endowed China's political system with the ability to control and drive China's long-term economic development.

The Leading Group for Comprehensively Deepening Reforms (LGCDR) was established in 2013 after the 3rd Plenary Session of the 18th Central Committee of the CPC. The major responsibility of this group is to plan reforms and drive and coordinate their implementation among different party-state institutional structures. This Leading Group comprises six working groups: economic reform, legal reform, cultural reform, social reform, party-building and discipline inspection. Given the concentration of top leaders in its membership, the LGCDR is very powerful, but still faces an uphill challenge to gain support from the cadre corps whose interests are likely to be adversely affected by reform (Lance 2014). By 2014, all 31 of China's provinces had formed their own Leading Groups for Comprehensively Deepening Reforms, following the model of the central group.

Most of the members of the LGFEA are also members of the LGCDR. The LGCDR helps to

Table 1. Working group meeting (WGM) of Leading Group for Financial and Economic Affairs (LGFEA).

	Date	Issue for discussion
1st WGM	April 17, 2013	Establishing rules for new Leading Group and work focus in 2013
2nd WGM	July 15, 2013	Deepening the reform of the fiscal and tax system
3rd WGM	Sept. 27, 2013	New urbanization
4th WGM	Dec. 9, 2013	Food security
5th WGM	March 14, 2014	Water security
6th WGM	June 13, 2014	Energy security
7th WGM	Aug. 18, 2014	Innovation development strategy
8th WGM	Nov. 4, 2014	Belt and Road Initiative
9th WGM	Feb. 10, 2015	Progress review of the implementation of the Plan for Beijing-Tianjin-Hebei Coordinated Development, made in the 3rd WGM
10th WGM	July 20, 2015	Poverty alleviation and stock market regulation
11th WGM	Nov. 10, 2015	Economic transformation
12th WGM	Jan. 10, 2016	Supply-side reform, Yangtze River Delta Economic Zone
13th WGM	May 16, 2016	Supply-side reform
14th WGM	Dec. 21, 2016	165 key projects in 13th Five-Year-Plan
15th WGM	Feb. 28, 2017	Review of 2016 and work focus in 2017
16th WGM	July 17, 2017	Improving investment and market environments, further opening of the economy to the outside world

Source: Xinhua Net (2018b).

achieve the goals of the LGFEA within this so-called ‘double engine’ system. For example, supply-side structural reform was first raised in the 11th Meeting of the LGFEA to transform economic growth. Following this, the LGCDR initiated a series of reforms focused on the financial system, fiscal and tax system, and administration of SOEs.

The National People’s Congress

According to the revised 2018 constitution, the NPC has the power to amend the constitution, enact and amend laws and legislation, and review and approve the government budget and its annual working

report. The People’s Congress is the country’s most powerful state entity and its only legislative body. It also has the right to elect and appoint top government officials, the supervision committee and the judiciary. In reality, these powers are exercised under the CPC’s leadership.

In the document entitled “Several Opinions on Strengthening the Party’s Leadership on National Legislation,” which was issued by the CPC Central Committee in 1991, it was made clear for the first time that China does not have separation of powers, with legislative functions falling under the leadership of the CPC. The CPC gets prior approval of legislative guidelines and principles of legislation

and important laws are then submitted to the CPC Central Committee for deliberation before their approval. A document issued by the CPC Central Committee in 2016, “Opinions on Strengthening the Party’s Leadership on Legislation,” further supported this practice. The 2016 document provides the most detailed specification to date on how the Party will lead the legislation work but leaves some questions unanswered. These include: Which is the appropriate body to represent the Party? How can the government ensure this leadership is built on the right principles rather than unconditional obedience? What if a disagreement occurs between the NPC and the Party (Liu 2017)?

The NPC comprises approximately 3,000 deputies elected from 35 electoral districts, including all of China’s provinces, autonomous regions, municipalities, special administrative regions and the PLA. Deputies include politicians and government officials, workers, farmers, artists and entrepreneurs representing different regions and ethnic groups. This composition makes it possible, in principle, for the concerns of minority groups and distant regions to be heard at the national level.

Each congress is elected for a term of five years and holds its general convention once a year in March. The majority of the NPC’s work is undertaken by its Standing Committee which contains about 171 members and is supported by nine Special Committees covering ethnic affairs; law; internal and judicial affairs; finance and economy; education, science, culture and public health; foreign affairs; overseas affairs; environmental protection and resources conservation; and agriculture and rural development. Two subcommittees play critical roles in the energy sector: the Finance and Economic Committee has control over the amendment of existing laws and formulates new laws covering a range of energy resources (excluding the renewable

energy law), energy conservation and taxation of energy; the Environment Protection and Resources Conservation Committee is in charge of renewable energy legislation and climate change laws.

The operating mechanism of the NPC combines democracy and centralization, under which the minority is required to obey the majority while low-level organizations obey higher-level organizations (Liu 2011). The legislative process of the NPC follows four stages: planning, bill drafting and initiation, deliberation, and voting and promulgation. To avoid confrontation in the formal stage of the decision-making process, the NPC tends to reach an agreement before the final vote. Disagreements, bargaining, and lobbying mainly happen during the drafting and deliberation stage through both formal and informal channels (Chen 2015). Many recent cases have shown that the NPC deputies and its staff are taking much greater responsibility as the NPC becomes more institutionalized and professional. This is a major change from the NPC’s previous image as a ‘rubber stamping’ body.

Over the past decade the NPC has made significant progress on energy and environmental laws. The Renewable Energy Law was adopted in 2005 and amended in 2009. The Coal Industry Law was amended for the fourth time in November 2016. The Oil and Natural Gas Pipeline Protection Law was adopted in 2010 and is was being revised at time of writing. The Electric Power Law was amended for the second time in April 2015, and a new revision to help achieve the goal of rapid power market reform is under review. The adoption, amendment and enforcement of these laws have greatly facilitated China’s energy transition, despite the relatively slow implementation of the Energy Law and the Oil and Natural Gas Law when compared with the more rapid pilot reforms.

The State Council

Headed by the country's Premier, the State Council is the highest organ of China's state administration. The State Council is responsible for implementing the principles and policies of the CPC and the regulations and laws adopted by the NPC. It also handles China's internal politics, diplomacy, defense, finance, economy, culture and education. The State Council serves for a five-year term and incumbents cannot be reappointed after two successive terms.

The State Council consists of the Premier, Vice-Premiers, State Councilors, ministers in charge of ministries and commissions, the auditor-general and the Secretary-General of the State Council. The Premier is nominated and appointed by the President with approval from the NPC. The Premier nominates other members of the State Council, and the President appoints them with approval from the NPC. The Premier and the First Vice-Premiers sit on the PSC, the remaining three Vice-Premiers are members of the CPC Politburo, and the State Councilors are members of the CPC Central Committee. Under this political structure, the State

Council is accountable to both the CPC and the NPC and acts as an administrative cabinet to the CPC Politburo.

The institutional structures under the State Council can be divided into four levels. At the top are the supra-ministerial agencies, such as the NDRC, responsible for macro or comprehensive management across the entire economy. Below that are the line ministries responsible for policymaking and administration for specific areas, such as the MFA. The third tier includes the state administrations and non-administrative institutions with ministerial rank that are under direct supervision of the State Council, such as the State Administration of Taxation and the Chinese Academy of Sciences. The fourth-tier agencies are state administrations supervised by commissions or ministries, such as the NEA administered by the NDRC. In addition to this, other coordinating and advisory bodies are established and led by the State Council with the day-to-day work managed by commissions and ministries, such as the National Leading Group for Climate Change, Energy Conservation and Emissions Reductions.

The Backbone of Energy Governance

Below the top levels of the political pyramid, much of the critical activity in shaping and implementing policy takes place within the institutional structures at the national level (Lieberthal and Oksenberg 1988). Within central government, the commissions and ministries have been fragmented along the energy policy chain. The highly integrated relationship between government and enterprises under China's planned economy has been gradually split as Beijing moves toward a market-driven economy, as shown in Figure 3. The energy administration was centralized in some periods and decentralized in others, but its overall fragmented nature remained unchanged. The commissions at a higher level of government

usually integrate energy policies with other facets of the economy. The administrations and ministries managing specific aspects of the economy have authority on specific elements of energy policy.

This fragmentation also affects the vertical links in the formal organizational structure of government, where the relationship between the center and the provinces is subject to continual reform as policymakers seek to achieve an equilibrium between national uniformity and provincial autonomy. The roles of commissions and ministries are key to understanding the dynamics and complexity of energy policymaking and policy implementation in China.

Figure 3. Evolution of energy administrations in China.

Source: KAPSARC.

Note: The crossed-out names indicate the dissolution of related ministries or state bodies in that year.

The National Energy Committee

The National Energy Committee (NEC) was established in 2010 and its mandate was renewed in 2013 under the leadership of current Premier Li Keqiang. The NEC comprises around 20 ministerial members from the CPC Leading Group of Financial and Economic Affairs, the State Council and the PLA. The inclusion of senior intelligence, foreign affairs and military figures in the commission indicates that energy policy is an important national security concern. The fragmented nature of the Chinese energy sector and the blurred lines of supervisory authority create barriers to policy coordination. Therefore, as the highest advisory body on energy issues, the NEC is mandated with the task of drafting the national energy development strategy, discussing energy security, and coordinating domestic energy development and international cooperation. The chairman of the NDRC acts concurrently as the director of the NEC's Secretariat, while the NEA handles the day-to-day business of the NEC. Very little information has been released about the running of the NEC and changes to its membership. On Nov. 17, 2016, the NEC reviewed the 13th Five-Year-Plan (FYP) of Energy Development. Several commentators have been skeptical of the NEC's ability to fight the entrenched interests of China's energy administrations (Chen 2017; Cunningham 2015).

The National Development and Reform Commission

The National Development and Reform Commission (NDRC) is the most powerful of the bodies that operate under the umbrella of the

State Council. The NDRC has 26 departments and bureaus with over 1,000 staff involved in virtually every aspect of China's economy. The commission directs economic planning, operation and reform by coordinating policies across industries and regions and has a wide degree of authority to approve or reject major projects, price resources and to allocate investment funds. One of the NDRC's key priorities is to study, plan and draft the Five-Year Plan (FYP) for National Economic and Social Development under the leadership of the NPC, the Central Committee of the CPC and the State Council. The planning departments embedded in the ministries and the provincial governments are part of the NDRC's network, working to develop and reform China's national economic and social structure.

In addition to the NEA, at least another 11 departments in the NDRC are involved in different aspects of energy policymaking. Figure 4 details their responsibilities. The NDRC is responsible for setting energy-related targets in the FYP for National Economic and Social Development, regulating energy prices, driving energy reforms and proposing policy measures to balance the production, transportation and consumption of all kinds of energy commodities. The NDRC's role in coordinating energy, climate and environmental policies has weakened since the Department of Climate Change moved from the NDRC to the MEE as part of recent government administration reforms. The NDRC's role of supervising pricing and enforcing anti-monopoly policies was also moved to the NMSA. But its overall macroeconomic planning function has been boosted, focusing more on economic restructuring and market reforms and driving the development of high-tech industries and new economic zones.

The Backbone of Energy Governance

Figure 4. Energy-related responsibilities of the NDRC.

Source: KAPSARC based on NDRC (2018).

The National Energy Administration

The National Energy Administration (NEA) was initially set up in 2008 as a vice-ministerial body,

further strengthened in 2013 when it was merged with the State Electricity Regulatory Commission (SERC). With the regional and provincial offices inherited from the SERC, the NEA's total administrative headcount is close to 740. This is a significant increase from the headcount of 112 in

Figure 5. Departments and responsibilities of the NEA.

Source: KAPSARC based on NEA (2018).

2008. Figure 5 details the responsibilities of each department.

The NEA's new mandate and capabilities are much wider than previously. Twelve departments in the NEA cover legislation, reform, planning, industrial policies, market supervision and safety supervision in China's energy sector. . In addition, the NEA has its own Party Committee that gives it greater autonomy in managing its internal personnel affairs

while following official Party policy.

As a vice-ministerial body under the jurisdiction of the NDRC, the NEA lacks the authority to effectively coordinate the interests and actions of other ministries, commissions and state-owned energy companies (Downs 2008). Even inside the NDRC, the NEA needs to coordinate with relevant departments on issues such as energy strategy, energy plans, energy reforms, energy investment

The Backbone of Energy Governance

allocation, energy pricing and market supervision. To make up for this weakness, the director of the NEA is usually appointed as vice-chair of the NDRC, with ministerial rank. This dual role structure helps raise the profile of the NEA to some extent and improves its coordinating role within the NDRC.

There is a division of responsibility between the NEA and the NDRC (SCOPSR 2013), as detailed below. But in day-to-day operations, areas can overlap and slow down decision-making processes.

The NEA drafts and implements energy development strategies, energy plans, energy industry policies and energy reforms. These are coordinated and approved by the NDRC before their final submission to the State Council.

The NEA collects information and proposes the allocation of central government investment funding, but the NDRC makes the final decision and releases the final allocation plan.

The NEA drafts and proposes policies for strategic reserves of oil and natural gas, while the NDRC holds the right to approve and release the plan.

The NEA may propose or be consulted on any change to energy pricing, but the NDRC holds the final authority for such changes.

The Ministry of Finance

The Ministry of Finance (MOF) is responsible for drawing up China's fiscal and taxation strategy, managing the national budget and transferring funds to local governments. It manages the appropriation of state fiscal funding for investments, programs and subsidies. Furthermore, it drafts rules covering the administration of domestic government debt. It also manages SOEs in the financial sector and collects

the revenues from state-owned equity shares.

Although technically a ministry, the MOF effectively operates as a commission because of its wide range of responsibilities. It has its own network of bureaus embedded in other central ministries and provincial governments, which helps to communicate and drive policies both horizontally and vertically.

Two departments in the MOF are deeply engaged in energy policymaking: the Department of Tax Policy and the Department of Economic Construction.

The Department of Tax Policy drafts tax policies and tax reform plans, validates tax legislation and reviews the rules for its implementation. By studying and proposing changes to taxation policy, such as taxable items and tax rates, this department can direct energy market development toward a resource-efficient and environment-friendly outcome. The switch from specific to ad valorem rates for taxable items and the reform of resource taxes in 2011, 2014 and 2016 restructured the coal, oil, natural gas and other natural resource markets with a view to reducing carbon emissions and reshaped the fiscal and tax relations between central and local government. In response to the fall in international oil prices and growing public pressure to reduce urban air pollution, the consumption tax on refined oil products was increased three times between 2014 and 2015. The Law on Environmental Protection Tax, adopted on Dec. 25, 2016, was directly targeted at the transformation of high-emission and energy-intensive industries.

The Department of Economic Construction is responsible for the budget plans for industry, transport, energy, resources and construction, and administers the fiscal subsidy and special fund for these sectors. This department's role is crucial in leveraging the investment of local government and business in the clean energy market through its review of fossil fuel subsidies under the G-20

framework; the payment of additional renewable electricity subsidies; the allocation of special energy conservation fund; and the establishment of a special fund for industrial restructuring. This department coordinates and approves funding proposals and plans for the energy sector from the NDRC, the NEA and other related line ministries.

China is attempting to transition to a low carbon and environmentally sustainable economy. This, in turn, requires substantial changes to the public and private financial system. However, the lack of a clear picture of China's public spending makes it difficult for the government to evaluate the alignment of public spending with those priorities. A study supported by the United Nations Development Program found that the share of China's national public expenditure allocated to clean energy, energy conservation and environmental protection has been on a downward trajectory for five years (RIFS 2015).

Recent reforms in China have simplified the tax structure, introduced a revenue-sharing system and established a multiple budget system. The central government has increased its share of total tax revenue through the revenue sharing system, while local government has become more dependent on central government's transfer payments. The August 2014 revision of the Budget Law includes all line ministries' income and expenditure under budgetary supervision and mandates different levels of government to publicize their budget details. Future reforms of China's fiscal system are expected to continue to improve the relationship between government and the markets and between central and local government.

The Ministry of Foreign Affairs

The Ministry of Foreign Affairs (MFA) is responsible for implementing laws, regulations and policies that

have an external component. It analyzes major diplomatic issues, provides advice to the CPC Central Committee and the State Council and deals with diplomatic matters on behalf of the state. The international cooperation department or foreign affairs departments embedded in the central and local governments build a domestic network for the MFA. Embassies, consulates and representative offices around the world form its international network. Inside the MFA, the Department of Treaty and Law leads China's climate change negotiations and other environment-related treaty negotiations with the support of the NDRC and other line ministries. The Department of Policy Planning coordinates foreign economic policy issues, usually with MOFCOM.

Given the increasing attention being given to energy-related issues, international energy policy has become an increasingly important element in China's broader foreign policy. The desire to build closer political and economic relations with key oil and gas producers has been high on the government's diplomatic agenda. Energy forms a critical component of China's diplomatic strategy in some countries (Andrews-Speed and Dannreuther 2016). The MFA has facilitated the internationalization of Chinese energy companies by encouraging them to invest in or trade with the host country through the provision of economic packages, including financing for oil and gas projects, and by using its network of embassies and consulates to facilitate information flow.

In addition to building bilateral relations with oil and gas producing countries, China has been engaging with regional and global multilateral organizations. At a regional level, energy is an important topic in the deliberations of the Shanghai Cooperation Organization, the Association of Southeast Asian Nations Plus Three, the Greater Mekong Sub-

Region Cooperation and the Asia-Pacific Economic Cooperation forum. At a global level, China is engaging more closely with the United Nations Framework on Convention on Climate Change, the G-20, the World Energy Council, the International Energy Agency, the Energy Charter Treaty and the International Energy Forum.

There are many overlapping aspects of China's national security policy and its foreign policy as the latter also serves to protect China's national security interests. As such, the framework and coverage of its national security policy are broader than MFA's foreign policy (Sun 2013).

Ministry of State Security

The Ministry of State Security (MSS) is China's main intelligence agency and is responsible for counterintelligence, foreign intelligence and internal political security. The network for state security is separate from the network for public security, which is administered at the national level by the Ministry of Public Security and is responsible for domestic policing and related administrative matters. At a local level, the two systems cooperate extensively and often share resources.

China's growing demand for imported oil and imported natural gas to fuel economic development is likely to spur its continued integration into global energy markets. Oil price volatility and physical supply disruptions are considered major threats to China's energy security. The competition for energy resources has also created strains with other global powers such as Japan, Russia and the U.S. The inclusion of the MSS in the National Energy Commission (NEC) since its establishment in 2010 reflects the decision by China's top leadership to integrate energy security into the wider state security system as an important and emerging issue.

There is limited information available on exactly what role the MSS plays in energy security, but it would make sense for China to build an intelligence network centered on the country's far-reaching energy network. Governmental line agencies are seen as the primary sources for the MSS (Sun 2013), while information on, and analysis of, national security affairs from governmental and semi-governmental think tanks and academia are complementary resources. There have been proposals to build a sub-group inside the NSC to oversee energy security with the support of academic researchers, focusing on energy strategy, energy economics, energy politics and energy technology (Liang and Zhu 2014).

The Ministry of Commerce

The Ministry of Commerce (MOFCOM) is responsible for formulating strategies, policies, regulations and plans for domestic and foreign trade, inward foreign direct investment and outward investment. It is the main authority for examining and approving the establishment, and supervising the operation, of foreign companies investing in China as well as examining and approving outward direct investment. MOFCOM leads the negotiation and implementation of bilateral and multilateral trade agreements, handles the relationship and portfolio of World Trade Organization (WTO) issues, develops the list and quota plan for the import and export of commodities and technologies, and coordinates fair trade-related issues. The ministry also regulates domestic market competition for major consumer goods.

As discussed previously, MOFCOM is deeply involved in China's foreign policy, state security policy and energy security policy processes at a time when energy is emerging as a strategic component of state security, foreign relations, trade

and investment. Within MOFCOM, the Department of Foreign Assistance usually formulates and implements plans and policies to create foreign and economic relations with targeted countries. The Department of Foreign Trade, the Trade Remedy and Investigation Bureau, the Department of Outward Investment and Economic Cooperation, and the Department of Foreign Investment Administration, are mainly involved in policy and regulation development for the import and export of energy technology and commodities, as well as inward and outward foreign direct investment for energy projects. The global office network that MOFCOM has built plays an important role in identifying new markets and investment opportunities for Chinese companies as well as providing local knowledge.

MOFCOM and its provincial counterparts have the authority to issue Outward Investment Approval Certificates for Chinese enterprises. A number of MOFCOM's policy initiatives, such as simplifying the administrative approval process for outward investment and developing annual guidance for outward investments, have contributed to China becoming the third-largest foreign direct investor in the world (Davies 2013), which has resulted in the country holding a more diversified industrial and energy portfolio.

The role of MOFCOM in dealing with anti-dumping and countervailing cases has become increasingly important since China became the world's largest producer and exporter of solar photovoltaic (PV) technology and wind power products. In recent years, the U.S., Europe, Australia, Canada and India have all initiated anti-dumping and countervailing investigations into Chinese-made solar products. The anti-dumping and countervailing duties imposed by the U.S. and Europe on some Chinese PV products has had a significant negative impact on the development of the Chinese solar industry.

Coordinated efforts between MOFCOM and other energy-related administrators could help balance the global energy market expansion and domestic market development and improve communication with stakeholders in these countries.

Ministry of Natural Resources

Replacing the MLR, the Ministry of Natural Resources (MNR) is now responsible for the planning, management, protection and rational utilization of China's natural resources, including land, mineral, forests, wetlands, grasslands and marine resources. All of the MLR's former departments are now under the jurisdiction of the MNR. The Department of Mineral Resources Development Administration, the Department of Mineral Resources Reserves, the Department of Geological Exploration, and the Department of Land Use Administration are closely involved in the search for, and development of, energy resources in China. They oversee surveys and appraisals of natural resources and administer permits for resource exploration and production.

The Department of Mineral Resources Development Management is responsible for awarding exploration rights to mine coal, and metallic and non-metallic mineral resources. It defines the state-level mining concession areas and high-economic-value mining areas and stipulates the regulations and standards for mineral resources' development.

The Department of Mineral Resources Reserves is responsible for evaluating, registering and providing statistics for mineral resource reserves. It drafts related legislation, regulations and standards and draws up policies. It also supervises exploration and mining activities for all mineral resources, except oil, natural gas and coal-bed methane.

The Department of Geological Exploration researches and evaluates mineral and marine resources. It writes legislation, regulations and policies and draws up plans for the domestic oil, natural gas, coal-bed methane and shale gas sectors. It is also responsible for awarding exploration rights to extract oil, natural gas, coal-bed methane and shale gas. The department also approves foreign investment in these sectors. The department's Division of Oil and Gas provides day-to-day supervision.

The Department of Land Use Management is responsible for land use, land markets, land pricing and land assets in China. It develops and implements regulations for the assignment, lease, valuation, transfer, transaction and governmental purchase of land rights. It formulates standards and administers land use for energy projects and establishes the price of land. The Division of Land Use oversees land use policy development for industrial plants, power plants, coal, oil and gas facilities, and examines and submits applications for land use that require the approval of the State Council.

Crucially, the MNR is responsible for the supervision and administration of all exploration and mining activities for energy resources in China. It is also involved in the energy project approval process so far as it concerns land use. As part of China's energy reform process, the MLR has opened up the oil and gas exploration market and extended the scope of the exploration and mining transfer rights market. The MNR will remain the authority for awarding oil and gas exploration and development permits and approving energy blocks that might be open to foreign investment. The provincial counterparts of the MNR are in charge of mining activities for solid minerals such as coal. The National Plan for Mineral Resources (2016-2020)

announced the creation of 103 national energy resource bases, with a greater emphasis on natural gas, coal-bed methane, shale gas and geothermal energy. Only CNPC, Sinopec, China National Offshore Oil Corporation (CNOOC) and Yanchang Oil are currently permitted to explore and produce crude oil and natural gas in China.

Ministry of Ecology and Environment

The pollution-related functions of the MEP, NDRC, MWR, MOA, MLR and SOA have all been consolidated under the Ministry of Ecology and Environment (MEE), giving it increased authority over climate change and pollution control issues and indicating central government's increased enforcement role in these areas. The MEE will further expand its authority to supervise and prevent groundwater pollution, control wastewater emissions, protect rivers, oceanic environments and non-point source agricultural runoff. It will also have environmental oversight for China's ambitious South-North Water Transfer Project.

This reorganization may allow the new MEE to implement China's growing body of environmental laws with greater efficiency and consistency across the nation, something which has proved consistently challenging for the MEP. Placing climate change policy under MEE's remit will also help ensure that compliance with China's emissions trading system is enforced with the same vigor as other forms of pollution control, essential to meeting China's ambitious greenhouse gas emissions reduction targets. The high proportion of atmospheric pollutants attributed to the energy sector will keep the MEE involved in the energy policymaking process. Coordination with the NDRC, the NEA and the MNR will be necessary to manage energy-related pollution.

The revision of the Environmental Protection Law, effective 2015, and the new Environmental Protection Tax Law, effective 2018, have endowed the MEP and its counterparts at local levels with the greatest power in China's history to intervene in the country's economic and industrial activities. Based on the levy decided by the central government, local governments can increase the tax level according to their circumstances. All income from the environmental protection tax will remain with local authorities to strengthen law enforcement and improve the fiscal performance of local government (State Council 2017b). Discussions surrounding the details of the implementation of this policy are taking place to ensure the most effective use of tax income for local economies.

The Department of Environmental Impact Assessment is directly involved in energy sector planning and the energy investment approval process through its mandate to assess the environmental impact of industrial policy, economic planning and project construction activities. Environmental impact assessments are no longer an essential prerequisite for project approval but are a requirement in the construction phase. The 2016 revision to the Law of Environmental Impact Assessment gives more power to this department and its counterparts to evaluate industrial plans and administer penalties to those that break the law at the provincial level.

The Department of Water Environmental Management, the Department of Air Environmental Management, and the Department of Soil Environmental Management have responsibility for monitoring industrial, residential, agricultural and transportation emissions. Energy-intensive and high emission industries such as iron, steel, paper, cement, glass and coal-fired power plants, are subject to the control of these departments. These

departments also issue emissions permits and evaluate the success of pollution reduction targets.

The Department of Nuclear Facility Safety Regulation, the Department of Nuclear Power Safety Regulation and the Department of Radiation Source Safety Regulation together form the National Nuclear Safety Administration (NNSA). The NNSA is the licensing and regulatory body for nuclear and radiation safety, under the purview of the MEP. The deputy minister of the MEP acts as the NNSA's administrator. The NNSA is in charge of supervising and administering the design, manufacture, installation and non-destructive inspection of civilian nuclear safety equipment, and for issuing safety qualification certificates for nuclear facilities (NNSA 2015). It is also responsible for the administration of nuclear fuel, nuclear material and radioactive waste. China's plan for an unparalleled expansion of nuclear power poses a challenge to the regulatory body, which will have to invest further to effectively regulate nuclear and radiation safety.

Ministry of Industry and Information Technology

The Chinese government views information and communications technology as the industry that can help it transition from a manufacturing to a knowledge-based economy (Atkinson 2014). The Ministry of Industry and Information Technology (MIIT) was established in 2008, taking over a range of responsibilities from several entities including the former Ministry of Information Technology, the industrial administration arm of the NDRC, the non-nuclear administration of the Commission of Science, Technology and Industry for National Defense (COSTIND), and the State Council Information Office. In 2015, the State Commission Office for Public Sector Reform (SCOPSR) removed the responsibility of promoting information and

The Backbone of Energy Governance

coordinating information security from the MIIT to the Office of the Central Leading Group for Cyberspace Affairs.

MIIT is responsible for drafting and implementing plans, policies and standards for industrial development, facilitating the integration of information technology with traditional industry and promoting the development and use of information and communications technology in China. It has played a crucial role in eliminating excess capacity in the industrial sector and in driving China's industrial transformation. Its role has strengthened since the launch in 2015 of supply-side structural reforms.

Four MIIT departments play a role in upgrading and transforming industrial development in China:

The Department of Energy Conservation and Comprehensive Resource Utilization is responsible for drafting and implementing policies and developing programs for energy conservation and resource recycling in the industrial and information technology sector. It also participates in the related national planning and policy development process.

The Department of Industrial Policy phases-out outdated and excess capacity by provinces and industries, formulates market entry criteria for key industries such as coking and glass fiber, and oversees the entrance of companies to these sectors.

The Department of Equipment Manufacturing oversees market entry and industrial development in sectors such as mechanical engineering, automotive, aviation, shipping and engine manufacturing and critical mechanical technologies.

The Department of Material Industry oversees market entry and the industrial development of petrochemicals, coal-based chemicals, iron and steel, nonferrous metals, rare earths and construction materials. Key exceptions set out by the SCOPSR in 2008 give the NEA direct control over refining, coal-to-fuel and fuel ethanol industries.

Compared to the NDRC and MEE, the MIIT is in a relatively weak position in its ability to drive industrial energy policy. The NDRC and the MOF have control over the central government's fiscal funding and investment approvals and coordinate with all related ministries. Backed by the new Environmental Protection Law, the MEE and its local counterparts now have more power over supervising the energy consumption and the emissions of industrial enterprises. The central government has further defined the division of responsibilities between the MIIT and the NDRC to reduce the potential for conflicts of competing standards, policies and programs from different ministries (SCOPSR 2015). The NDRC is in charge of the overall administration of fixed-asset investment and defines the scope, standards and procedures for investment approvals. It also approves, reviews and verifies high-priority cross-regional and cross-industry projects with input from the MIIT from an industrial administration perspective. In association with the NDRC, the MIIT may propose and release investment plans for industrial projects. However, following the decision by the NDRC to devolve authority over energy conservation evaluation in fixed-asset investment projects (NDRC 2016b), the MIIT has also ceded responsibility for reviewing industrial energy conservation performance.

Ministry of Transport

The Ministry of Transport (MOT) was created in 2008 following the merger of the Ministry of

Communications, the Civil Aviation Administration and the State Postal Bureau. The MOT also gained control over urban passenger transport from the Ministry of Housing and Urban-Rural Development (MOHURD). In 2013, the Ministry of Railways was disbanded and became the National Railway Administration under the purview of the MOT. The MOT is now responsible for formulating and implementing plans, policies and standards for rail transportation, highways, waterways and aviation.

Growing demand for fossil fuels in the transportation sector amplifies China's energy security, climate safety and air quality challenges. The 13th FYP for a Modern Comprehensive Transportation System, announced in February 2017, called for a safe, efficient, green and integrated national transport system. The Department of Comprehensive Planning, the Office of Policy Research and their respective administrations covering specific transport modes in the MOT are key to building an integrated transport infrastructure and improving fuel efficiency in the transportation sector.

The Department of Comprehensive Planning is in charge of developing the strategy and policies for an integrated transportation system and for coordinating the development of a range of transport modes. It draws up investment plans for the country's rail, highway and waterway networks and approves fixed-asset investment projects. It is also responsible for energy conservation and environmental protection in the transportation sector and maintains transportation statistics.

The Office of Policy Research is responsible for strategic policymaking and for drawing up plans to reform the transportation system. It

also provides advice on highway and waterway transport network reform and the reform of local transport administrations.

The Bureau of Waterways, the Bureau of Highways, the National Railway Administration and the Civil Aviation Administration of China (CAAC) supervise investments in, and the construction of, key transport projects. They also draft and implement policies and standards and administer market operations and technology development for each sector. Energy conservation and environmental protection are at the top of their agenda. For example, the CAAC has a plan covering energy conservation and pollution control over the 13th FYP period. The Bureau of Highways and the Bureau of Waterways implemented a plan called "Low Carbon Transport Program: Top 1,000 Enterprises on Vehicle, Ship, Highway and Harbor" during the 12th FYP period. The National Railway Administration has promoted rail electrification as a key initiative for energy conservation, which in turn has led to China having the world's largest high-speed rail network.

Ministry of Science and Technology

The Ministry of Science and Technology (MOST) is responsible for developing policy and launching initiatives related to science and technology. It coordinates relevant ministries and academies in designing and implementing key research programs in specific priority areas. As with the NDRC and the MOF, MOST has an office in each central government ministry and also within provincial governments to ensure coordinated science and technology policies.

The Chinese leadership recognizes that innovation in science and technology is key to the future of the country's economy. In the wake of President Xi's call for an energy revolution in 2014, many ministries have developed plans and initiatives to support the energy transition. The NDRC and the NEA developed the Innovation Action Plan for the Energy Technology Revolution (2016-2030). The NDRC, MIIT and NEA jointly released the Energy Equipment Plan for Made-in-China 2025. Energy and environmental technology research is top of the agenda for MOST's research programs. In the 13th FYP for Science and Technology Innovation, released by the State Council, developing clean and more energy-efficient technologies is a priority for government at all levels.

As noted in the decision for national science and technology system reform (State Council 2014a), improved funding and project management is critical for improving China's innovation capacity. To align the funding plans of different ministries, an inter-ministerial coalition meeting mechanism was developed in 2015, with MOST taking a leadership role. Members of the coalition include the MOF, the NDRC and other related ministries. A unified online program administration system was also constructed to publicize and integrate the funding allocation throughout the chain of technology research, development, demonstration and commercialization. The research funding and programs administered by MOST, along with the industrial technology development funding administered by the NDRC and MIIT, were combined as an integrated key research program. The funding administered by the NDRC and the MOF for emerging industry ventures, by the MOST for scaling research from laboratory to production, and the funding jointly administered by the MOF, MOST, MIIT and MOFCOM for science and technology innovation in small- and medium-sized enterprises, will be further integrated to leverage investment opportunities.

The reform of the national science and technology development system is expected to have a significant impact on the allocation of resources among the different ministries. Even if the system functions, as envisaged, in an integrated manner, each ministry still has to play a different role along the energy technology development chain. Overall, the NEC will continue its coordinating role across ministries, while MOST will lead the key national research program for energy, with the NDRC and the NEA leading the design and implementation of energy technology demonstration projects. For its part, the MIIT is responsible for energy equipment manufacturing. Inside MOST, the Department of High-Tech Development and Industrialization leads energy technology development and, together with the Department of Science and Technology for Rural Development, biofuel technology development. The Department of Science and Technology for Social Development is developing natural resource and environmental technologies, while the Department of Basic Research provides support for energy-related research platforms and the national laboratory network.

Ministry of Water Resources

The Ministry of Water Resources (MWR) is responsible for drafting the strategic plan and legislation covering water resources conservation. It develops comprehensive watershed and flood control planning, dispatches water resources and ratifies the pollutant-carrying capacity for major rivers and lakes. It reviews and approves soil and water conservation plans for medium and large projects and also provides advice on implementing important soil and water conservation projects.

Within the MWR, six departments and bureaus are closely involved in the development of China's hydropower. The Department of Planning and

Programming is in charge of the medium- and long-term plans for water resource planning and approves migrant resettlement plans. It also handles project proposals, feasibility studies, preliminary designs of key national water projects and central fiscal funding investment proposals for water conservation. The Department of Soil and Water Conservation is responsible for approving the soil and water conservation plans for large- and medium-sized construction projects and supervises their implementation. Reservoir and dam management is the responsibility of the Department of Construction Administration that provides guidelines for their operation and maintenance, while the Department of Safety Supervision supervises the safe operation of water conservancy facilities. The Bureau of Rural Hydropower and Electrification Development provides guidelines covering rural hydropower development and formulates and implements policies and plans for small hydropower projects. The Bureau of Reservoir Resettlement Development provides guidelines for the migrant resettlement required for water conservation projects. It undertakes migrant resettlement plans for key projects approved by the central government and oversees their implementation on a provincial level.

The national government reasons that the development of hydropower should be linked to issues such as water resource planning, environmental management, ecological restoration and local social and economic development (NDRC 2016a). The many responsibilities of the MWR, including water resource assessment, soil and water conservation planning, reservoir and dam safety supervision, flood control and drought relief coordination, and the resettlement of migrants for water conservation and hydropower projects, make the ministry an essential element in the approval process for large-scale hydropower projects.

Furthermore, growing public concern surrounding the environmental impact of large hydropower projects and population resettlement issues has lengthened the approval times for hydro projects.

The hydropower planning and approval process between the NEA and MWR could be improved, particularly regarding development planning for key rivers (NEA 2016). The 13th FYP for Hydropower Development states that new capacity totaling 60 gigawatts (GW) will come mainly from large hydropower projects. The development of small- and medium-sized hydropower projects is highly restricted, except to help alleviate poverty in areas such as Tibet, Sichuan, Yunan, Qinghai and Gansu. Historically, the MWR has been responsible for improving access to electricity for people living in these provinces.

State-Owned Assets Supervision and Administration Commission

The State-Owned Assets Supervision and Administration Commission (SASAC) is a ministerial-level agency directly administered by the State Council. It has titular ownership of central government-administered SOEs. SASAC is the Chinese government's shareholder representative for SOEs. SASAC manages state-owned assets, improves SOEs' corporate governance, and participates in and supervises SOEs' financing. It also evaluates the performances of key executives and manages their appointments and re-assignments. It also manages the reform and restructuring of SOEs.

SOEs have played a key role in China's national economic development. SASAC does not manage the day-to-day operations of these enterprises

The Backbone of Energy Governance

but takes over when political or strategic policy decisions are required. As a result, SASAC has a direct impact on the operation of these enterprises. In addition to the 29 representative offices supporting the Supervisory Board of 102 SOEs, five bureaus inside SASAC provide guidelines relating to corporate governance, investment planning and financing.

The Bureau of Corporate Reform studies the policy recommendations for SOE restructuring, drafting plans for mergers, stock market listings, shareholding restructurings and establishing joint ventures involving supervised enterprises. It also facilitates the establishment of social support programs and resettlement plans for employees laid off by these enterprises.

The Bureau of Property Right Management studies the regulations covering property rights management and manages records relating to the transfer and administration of properties held by SOEs. It also reviews the need to increase paid-up capital and manages equity holdings and the issuance of new debt.

The Bureau of Capital Operation and Returns Management provides guidelines on state-owned capital investment and the establishment of investment funds. It drafts regulations covering the management of SOE operational budgets and has oversight over their implementation.

The Bureau of Planning and Development reviews policy recommendations covering the role of SOEs in economic development and industrial restructuring. It supervises inward investment, controls SOEs' internationalization strategies and manages any outbound investment activity.

The Bureau of Appraisal and Distribution undertakes performance reviews and drafts salary and incentive schemes for the executives of the supervised SOEs.

Following successive restructurings, the number of SOEs supervised by SASAC fell from 196 in 2003 to 102 in 2016 (SASAC 2016), while the total asset base has grown from \$1,000 billion to \$6,900 billion. Reforming China's SOEs is now widely regarded as the best way to ease the effects of the recent economic downturn and to transform China into a more advanced economy. SASAC is now shifting its focus from managing state-owned assets to the use of state capital, with the aim of releasing SOEs' hidden potential and improving their efficiency. State capital investment and operating companies are to be jointly established by SASAC and the supervised SOEs under the current reform plan (State Council 2015). These corporations will invest on behalf of SASAC in areas that represent the lifeline of the Chinese economy and are vital to state security, including national defense. In March 2017, 10 SOEs, including the COFCO Group, the State Development and Investment Corporation and the Shenhua Group started a pilot state capital investment company.

Supportive Groups for Energy Decision-Making

Research institutions and think tanks have played active and supportive roles in all aspects of China's energy decision-making. Typically, think tanks affiliated with the party-state apparatus and SOEs produce two types of reports to support energy policy decision-making. Much research follows a bottom-up information flow to keep decision-makers updated on the latest developments in their areas of expertise. Commissioned reports offer a top-down analysis of particular issues to assist in decision-making (Sun 2013).

The close interaction between think tanks and party-state agencies gives think tanks a degree

of influence over energy policy. For example, the ERI under the leadership of the NDRC provides an influential flow of information and policy analysis on the energy economy and energy policy. The China Institute of International Studies is the research arm of the MFA, and the DRC provides regular direct updates to the CPC and the State Council. The foreign policy studies emanating from the China Institute of Contemporary International Relations go directly to the MSS.

The industrial associations, which operate independently from central government, also influence policymaking as a result of their historical links with government and their understanding of

Figure 6. Policy research groups by type.

Government-affiliated research institutes

Development Research Center, the State Council

- Researches strategic and ad hoc issues assigned by the CPC and State Council, and provides insights on national and regional development policies, macro-economic instruments, industrial restructuring and investment strategies.
-

Energy Research Institute, the NDRC

- Energy economics analysis, energy systems modelling, energy planning, policy study on energy efficiency and renewable energy.
-

National Center for Climate Change Strategy and International Cooperation, the NDRC

- Drafts China's national climate change strategy, studies policies for carbon trading and low-carbon energy development, and provides technical support for international climate change negotiations and cooperation.
-

China Academy of Fiscal Sciences, the MOF

- Researches fiscal system governance, government budgets, state-level taxation, management of state-owned assets, rural fiscal policy, urban fiscal policy, regional fiscal policy and local fiscal policy.
-

China Institute of International Studies, the MFA

- Researches a wide range of foreign policy issues, particularly those concerning international politics and the world economy. Focal area includes China's energy strategy, periphery security and economic security.
-

China Institute of Contemporary International Relations, the MSS

- Researches politics, economics, foreign affairs, military and social issues around the world, provides insights and analysis to relevant governments.
-

Supportive Groups for Energy Decision-Making

SOE-affiliated research institutes

Energy Research Institute, the State Grid Corporation

- Strong expertise on electric power and power grid related strategy and policy, mid- and long-term plan, market and system reform. Involved in the policy decisions for smart grid, electric vehicle, and power system 'revolution.'

China Coal Research Institute, China Coal Technology and Engineering Group

- Undertakes major government-funded research projects in the coal industry, with expertise covering the whole of the coal industry supply chain from coal extraction to clean use of coal.

Energy Economic Institute, China National Offshore Oil Corporation (CNOOC)

- Provides technical support to the CNOOC, researches strategies and policies for oil and gas market development, studies energy governance and international energy politics.

Economics & Technology Research Institute, China National Petroleum Corporation (CNPC)

- Provides technical support to the CNPC, provides information and policy advice for national oil and gas strategy and policy development, and studies oil and gas related overseas investment, industry and market development.

Economics & Technology Research Institute, Sinopec

- Provides technical support to Sinopec; provides input to national energy strategy, macro-economy and industry-specific policies; studies the oil market and price change of crude oil, refined products and petrochemicals.

University and industry associations

Tsinghua University

- Policy and technology roadmaps for low carbon energy development, energy environment and economy modeling, research and development of key energy technologies and solutions.

North China Electric Power University

- Board of Trustees chaired by the China Electric Council and composed of seven state-owned power corporations. It studies power policy and power reform, provides technical assistance on national power planning and key program development.

China University of Petroleum

- Distinguished research capabilities in oil and petrochemical industry; 65% of its research projects supported by big oil companies like CNPC, Sinopec, CNOOC, Total, Shell.

China Electricity Council

- Provides advice to government on power-related policy, legislation, planning, and market regulation. Produces power industry statistics. Membership comprises 939 companies covering power generation, transmission, distribution, engineering, construction, and technology research.

China Petroleum and Chemical Industry Federation

- Reformed from National Administration of Petroleum and Chemical Industry covering 41 industry association. Provides advice on petroleum and petrochemical-related policy, planning, legislation and standards. Conducts on-site investigations and statistics analysis.

Source: KAPSARC.

the business dynamics of specific sectors. For example, the China Petroleum and Chemical Industry Federation was spun off from the National Administration of Petroleum and Chemical Industry in 2001 and acts as an umbrella for 41 industry associations that together cover 70% of the Chinese petrochemicals market.

This large group of subject-experts offers a full range of policy advice. Assessing the extent of their influence on China's energy policy is difficult.

However, it has been widely recognized that their interaction with industry, NGOs, the media and international counterparts has improved public participation in energy decision-making under China's current political regime. These organizations provide an opportunity for opinions to be heard and discussed outside of the party-state institutional structure. Figure 6 presents a short list of players in each group to illustrate the specific areas in which they are involved.

Mapping Influence in Energy Policy Decision-Making

In general, 12 government administrations are involved in the energy value chain, from resources exploration to final energy use.

Another eight administrations are in charge of fiscal, financial, foreign affairs and state security, which can also shape energy policy. Figure 7 shows the general distribution of government administrations associated with energy policymaking.

There has been limited academic research on the interaction between government administrations involved in energy policymaking and the effects of this fragmented energy governance on the

development of China's energy sector. This paper focuses on five key elements of energy policy: national energy strategy and planning, energy pricing, investment approval, energy market access, and work safety supervision. By analyzing the specific roles of different administrations in each of these domains, and exploring the interplay between regulators and the market, this paper aims to provide a clear picture of the current dynamics of energy governance in China. It also aims to identify some of the issues that are likely to become the next battleground in the energy governance process.

Figure 7. Government administrations involved in the energy policy chain.

Source: KAPSARC.

Power in Drafting Strategic Plans

The fact that energy underpins economic growth and social cohesion means that China's national energy strategy is integrally linked to national security issues, foreign relations, economic development planning and environmental policy. Like many other countries, China has been struggling to maintain a balance between the three pillars of the energy trilemma, namely energy security, economic efficiency and environmental sustainability. As some studies have pointed out, the fragmented nature of China's energy governance delays key policy decisions because a large number of competing and sometimes contradictory views need to be assessed (Downs 2004).

To deal with this, China has established several fora to discuss, review, coordinate and decide strategic energy issues. The system is opaque and there is limited publicly-available information, but several key institutions appear to play critical roles in formulating strategic energy policies:

As the highest energy advisory body, the NEC includes 20 ministerial-level members from the CPC, the State Council and the PLA in discussions on energy strategy and long-term plans. The NEC reviewed the 13th Five-year Energy Development Plan (2016-2020) before the State Council approved it.

The CPC Leading Group for Financial and Economic Affairs is in charge of strategic economic policy decisions under the leadership of President Xi Jinping. Key energy policies are part of the group's agenda. For instance, the 6th Working Group Meeting in June 2014 discussed energy security issues. Subsequently, an 'energy revolution' was announced by President Xi as an essential strategy to combat international and domestic challenges.

The CPC CNSC now appears to be the highest decision-making body for both foreign policy and state security policy, as per the communiqué of the 3rd Plenary Session of the 18th CPC Central Committee. Energy security is top of its agenda given its growing importance in geopolitics and as a tool for economic cooperation.

Since the 'energy revolution' was announced by President Xi at the meeting of the CPC Leading Group for Financial and Economic Affairs in 2014, there has been increased attention on energy policy. This has resulted in a large number of new initiatives. Specific energy action plans, shown in Table 2, were developed to support the implementation of the energy revolution strategy. The NEA either leads the process of drafting or provides input into the drafting process of these

Table 2. Energy development plans issued by state administrations.

	Energy strategy and plans	Date issued	State administration
1	Strategic Action Plan for Energy Development (2014-2020)	Jun. 7, 2014	The State Council
2	Action Plan for Energy Technology Revolution and Innovation (2016-2030)	Apr. 7, 2016	NDRC and NEA
3	Energy Equipment Action Plan for Made-in-China 2025	Jun. 12, 2016	NDRC, MIIT and NEA
4	13 th FYP for Science and Technology Innovation (2016-2020)	Jul. 28, 2016	The State Council
5	13 th FYP for Electric Power Development (2016-2020)	Nov. 7, 2016	NDRC and NEA

Power in Drafting Strategic Plans

6	13 th FYP for Wind Power Development (2016-2020)	Nov. 16, 2016	NEA
7	13 th FYP for Solar Energy Development (2016-2020)	Dec. 8, 2016	NEA
8	13 th FYP for Renewable Energy Development (2016-2020)	Dec. 10, 2016	NEA
9	Energy Conservation and Emission Reduction Comprehensive Work Plan in 13th FYP Period (2016-2020)	Dec. 20, 2016	The State Council
10	13 th FYP for Coal Industry Development (2016-2020)	Dec. 22, 2016	NDRC and NEA
11	13 th FYP for Oil Development (2016-2020)	Dec. 24, 2016	NDRC
12	13 th FYP for Natural Gas Development (2016-2020)	Dec. 24, 2016	NDRC
13	13 th FYP for Energy Development (2016-2020)	Dec. 26, 2016	NDRC and NEA
14	13 th FYP for Energy Technology Innovation (2016-2020)	Dec. 30, 2016	NEA

Source: KAPSARC.

Figure 8. Flowchart of plan formulation in China.

Source: WWF China (2008).

plans. The direct involvement and endorsement by the NDRC is an essential step for their final release.

Provincial governments also play a role in the overall energy planning process. According to the Administration Measures for Provincial Energy Development Planning, the provincial plan provides the basis for energy project approval, government fiscal funding allocation, and the regulation of energy-related industries. The drafting process of the 13th FYP for Energy Development Plan outlined the coordination between provincial plans and the national plan. This includes coordination meetings between the various provinces, with one such meeting held in 2015 before the national energy development plan was finalized. The internal

consultation and negotiation process between the provincial and central governments has increased in importance since the central government devolved administrative power to provincial governments.

The interaction between local and central government, the coordination between sector plans and national plans, and external consultation with think tanks and enterprises is part of a drawn-out process used in developing China's energy plans. As a result, work on a new FYP starts at least one year before the end of the previous plan, and the release of the new plan usually happens at the end of the first year of the new FYP cycle. Figure 8 shows the flowchart of plan formulation in China, which is applicable for most plans, including energy-related plans.

Power in Setting Energy Prices

The NDRC's Pricing Department is in charge of monitoring, forecasting and setting key commodity prices, including energy-related prices. According to rules established by the State Council, the NEA can propose energy price adjustments and is consulted by the NDRC on proposed energy price changes (SCOPSR 2013). However, the NDRC and, ultimately, the State Council retain control over energy prices.

Coal pricing

Coal prices were the first energy-related prices to be fully liberalized in China. The decline in the price of coal from 2011 to 2016 led to losses for almost all of the country's coal producers. The Chinese government has used a variety of policy instruments to stabilize coal prices (Figure 9). On the supply-side, Beijing put mandatory caps on coal production and closed excess production capacity. At the same

time, the government greatly increased electricity tariffs payable by heavy industry. The life cycle of China's coal capacity reductions and the working day limit policies introduced in 2016 present interesting case studies of how government interventions can fail and lead to a number of unintended consequences, including supply shortages, abrupt price spikes and market distortions (Shi et al. 2018). In 2016, the NDRC, the Ministry of Human Resources and Social Security, the NEA and the National Coal Mine Safety Administration (NCMSA) jointly enacted a policy capping coal mining activities from 330 to 276 working days per year in a bid to limit the supply of coal to the market (State Council 2016). This policy was gradually softened after a surge in coal prices and growing concerns over meeting winter demand. The policy was suspended in October 2016. The policy change indicates the significant challenges involved in the command-and-control approach to market price responses.

Figure 9. Government's role in adjusting the coal price.

Source: KAPSARC.

Oil pricing

International oil markets have been volatile over the past decade. China has introduced a series of reforms to the oil pricing mechanism since 2009, as well as a fuel tax, in an effort to link domestic retail petroleum product prices more closely to international crude oil market prices (Figure 10). These measures have focused on sharpening the price reference system and building buffer zones to minimize the shock to downstream petrochemical industries and consumers. The NDRC can adjust domestic prices when global crude oil prices drop below \$80 per barrel (bbl), between \$80/bbl-\$130/bbl and above \$130/bbl, and can even freeze the price adjustment when the oil price reaches a floor of \$40/bbl. This mechanism allows domestic prices to vary

within a defined band linked to international market prices, although the government retains full control of prices. The opacity of the adjustment mechanism, combined with the time lag and uncertainty over the government's willingness to regularly adjust the price of critical commodities such as petroleum products, sends uncertain signals both to the market and to the general public. The possibility of establishing an independent regulator tasked with the responsibility for setting energy prices under guidelines set by the government is increasingly being touted.

Natural gas pricing

Domestic natural gas prices, covering wellhead prices, processing fees, and transmission and

Figure 10. Changes to the oil pricing system in China.

Source: KAPSARC.

distribution tariffs, were traditionally regulated by the government along the value chain. Tight control of natural gas prices in China has been a major hindrance to the development of the country's gas resources, competitiveness with other fuels and overall market efficiency (Fang and Ma 2017). Reforming the pricing mechanism and ensuring efficient third party access to infrastructure have been the top priorities of China's policy agenda for the natural gas industry over the last decade (Rioux et al. 2018). The degree of regulation has varied according to the source of the gas, the means and routes of transportation, and the type of end user (Chen et al. 2018).

A major change for onshore natural gas in China took place when prices were switched from an administered costplus wellhead pricing regime to

a netback formula. The netback pricing formula is based on citygate prices: the price charged to municipalities in key cities, indexed to alternative fuels such as liquefied petroleum gas (LPG) and fuel oil. The NDRC established the citygate price formula in November 2015 for 29 provinces and municipalities. Gas prices for bulk industry users (excluding fertilizer producers) are agreed in direct negotiations with gas producers, with a 20% increase cap over citygate prices, but without a floor. Offshore and unconventional gas are not governed by the netback pricing regime and are usually subject to negotiations between the seller and the buyer. However, if the gas is pumped into a long-distance pipeline, citygate prices are used for reference with an additional fee charged for pipeline transmission (Figure 11).

Figure 11. Natural gas pricing structure in China.

Source: KAPSARC.

More clarity in the mechanism under which citygate prices respond to changes in international gas market prices will be needed if China is to fully liberalize its natural gas markets and move toward a market-based pricing system (Paltsev and Zhang 2015). Without further reforms across the natural gas supply chain, China is likely to miss its planned target share of natural gas in total domestic energy consumption by the end of the decade. Reducing the price spread between different market segments that occurs due to government price interventions can be instrumental in supporting incremental demand (Rioux et al. 2018). As envisaged in the 13th FYP, future natural gas price reform will focus on regulating prices for pipeline transmission and distribution, while leaving the price of different sources of gas for different types of end users up to market forces.

Electric power pricing

As more than half of China's coal is used for power generation and around 75% of the country's electric power comes from coal-fired power plants, changes in the price of coal quickly impact the profitability of the power sector. Currently, the NDRC sets the generating tariff for coal-fired power plants in each province. As Figure 12 shows, the generating tariff for other types of power plants is regulated according to region and fuel type, using the coal-fired power plant tariff as a benchmark (Zhang and Qiu 2015). The mismatch between the market-based coal price and the government-controlled generating tariff has meant that the government has frequently had to modify the pricing mechanism. Under the latest formula, the government adjusts the power generation tariff if the coal price varies between 30

Figure 12. Electric power pricing structure in China.

Source: KAPSARC.

yuan per tonne and 150 yuan/tonne (NDRC 2015b). But this policy has failed to function efficiently in recent years. In 2015, the timelag between the fall in the price of coal and the realignment of generation tariffs led to record profits for coal power companies. In Hebei, Jiangsu and Guangdong provinces, the internal rate of return for capital investment in power projects has reached 30%, with some projects producing a full return on their initial investment in just three years. As a result, there has been increased investment into coal-fired power plants, which has worsened overcapacity in the sector and made it harder to control air pollution and reduce carbon emissions.

Pricing reform is at the core of electric power market reform, in particular the price-setting mechanism for transmission and distribution. Reforms to the power transmission and distribution market were piloted in Shenzhen, West of Inner Mongolia, Anhui, Hubei, Ningxia, Yunnan and Guizhou in 2015 and

expanded to include 12 other provincial grids in 2016. The reforms give a clear indication of the route the government intends to take: regulated prices for transmission and distribution and market-set prices for consumers.

The ongoing pricing reform has required the NDRC Pricing Department to switch its focus from setting and approving prices to predicting and regulating prices. In October 2015 the State Council took a further step forward in China's pricing reform process and announced that the government would only set prices for public utilities, public services, and natural monopolies, such as the electricity grid and the oil and natural gas pipeline network. By 2020, China is expected to have established a market-based energy pricing system for non-monopoly businesses. The challenge will then become one of monitoring and regulating prices, rather than discussing which government department has the authority to set prices.

Power in Energy Project Approval

There are three types of approvals for investments in new projects in China: the approval of government projects, the clearing of corporate projects above a set threshold, and the registration of corporate projects below the threshold. Since 2014, China has put in place a series of investment policy reforms aimed at giving businesses more freedom to invest in large-scale projects while improving the efficiency of government funding allocation and strengthening the role of government in supervising projects during their construction phase. In 2013, the government revised the project investment categories, originally established in 2004, that require government approval. The State Council further narrowed this in 2014, abolishing the need for pre-authorization in some instances and devolving authorization of 60% of projects to provincial governments.

Domestic energy project approvals

Unlike the project categories outlined above, companies that have permits for oil and gas exploration can make their own investment decisions. However, central government still controls investments in nuclear power, coal mining and heavy industry. Devolving the project approval process from central government to provincial governments is a step that could reactivate energy market investments but could also lead to the risk of excessive growth in high emissions industries. For example, in 2014 and 2015, project approvals and environmental assessments for coal-fired and thermal power plants were devolved by the NDRC and the MEP to their provincial counterparts. As a result, 195 projects with a total capacity of 159 GW obtained environmental assessment approval in 2015, three times more than the number of

approvals granted the previous year (Myllyvirta et al. 2015). This resulted in excess coal-fired power capacity and more air pollution, counteracting national policy objectives.

In addition to the authority to approve major projects held by the State Council, the NDRC and the NEA, a typical project approval process involves a further eight government entities. These include, but are not limited to, environmental impact assessments by the MEP and its local counterparts, land use pre-reviews by the MLR and its local counterparts, water use permission from the MWR and its local counterparts, grid connection permission from the provincial and the local electricity bureaus, project construction permission from the provincial and local construction bureaus, energy conservation assessments by the provincial counterparts of the NDRC, site selection approval by the provincial and local urban planning offices, and preliminary agreement from the Financial Institute. The supporting documents issued by these eight agencies are a prerequisite for final verification by the NDRC or its provincial counterparts. Figure 13 shows the roles of different government agencies in the project approval process, using a wind power project as an example.

The approval process of China's energy administrations has been greatly relaxed in recent years, while other government agencies involved in approving energy projects have been given a strengthened role, especially for environmental impact assessments. Investors often criticize this as one stamp less from the NDRC for project approval but more stamps for environment, safety and land screening. The new process reflects central government's intention to enhance its supervisory responsibilities.

Power in Energy Project Approval

Figure 13. Project approval process for a wind power scheme.

Source: KAPSARC.

Foreign energy investment project approval

Any outbound investment by a Chinese enterprise has to be verified by the NDRC under a project qualification review. The company involved also needs to apply to MOFCOM for an Enterprise Overseas Investment Certificate which is then registered with the State Administration of Foreign Exchange (SAFE). Given the ongoing reform of the outbound investment approval process in China, especially over the last decade, government administrations have relaxed their approval requirements and significantly narrowed their scope for intervention.

The approval threshold was \$30 million in 2004. As of 2014, only outbound investment projects

valued at more than \$1 billion, or projects involved in sensitive countries (or regions) and/or sensitive industries, need to be authorized by either the NDRC or the State Council. All other projects need only be registered by the NDRC or its provincial counterparts. The approval or registration documents issued by these bodies are no longer prerequisites for foreign investments. Companies no longer need to seek approval for foreign investments from MOFCOM or its provincial counterparts, but have to register them regardless of the investment amount. For its part, SAFE is gradually relaxing government controls on foreign currency to encourage outbound investment from Chinese businesses. As of February 2015, qualified banks approved by SAFE can process foreign currency transaction registrations for outbound direct investment. Previously, investors would first have to

register their intended transaction with SAFE before wiring the funds through a bank.

In addition, SOEs and/or listed companies must satisfy the approval, registration and supervision requirements of the SASAC and the China Securities Regulatory Commission (CSRC). The SASAC has oversight of state-owned assets and monitors any SOE investing outside China. Usually the SASAC and its local counterparts can authorize a qualified institution to make the required assessment. If necessary, SASAC and its local counterparts may conduct on-site inspections related to such investments. The approval of CSRC is only required if an overseas investment constitutes a material asset reorganization of the listed company, such as the purchase and sale of assets which reach prescribed limits and cause substantial changes to the principal business, assets and income of listed companies.

Those easing measures were introduced with the objective of accelerating China's 'going out'

policy and encouraging China's enterprises to invest overseas (Garcia-Herrero et al. 2015). The country's strategic initiatives are also encouraging companies to invest abroad. For example, after President Xi announced the BRI in 2013, several financial arrangements were established to support foreign investment by Chinese SOEs and private enterprises. The Silk Road Fund, a state-owned investment fund, was established with capital of \$40 billion to foster Chinese investment in countries covered by the BRI. The Asian Infrastructure Investment Bank is expected to support infrastructure investments carried out as part of the BRI using a considerable proportion of its \$100 billion capital. The China Development Bank has said it will invest almost \$900 billion in some 900 projects in 60 countries to boost the initiative. The more relaxed approval process, allied to strong financial support from official lending institutions, has resulted in Chinese companies playing a much more active role in the international energy market.

Power in Authorizing Market Access

Coal market access administration

Market access rules for coal development projects have changed frequently, depending on the state of the market. Typically, a shortage of coal encourages small- and medium-sized coal mining projects in China. However, these projects are often subsequently shut down when they are found to have lax environmental and safety standards. But overall, the coal market is the most liberalized of China's energy sectors. Coal production licenses that have been required for the past 20 years and coal business licenses that had existed for a decade were withdrawn in 2013 to improve market competition. The responsibility for energy resources exploration and land use moved from the MLR to the newly formed MNR as part of the 2018 government reforms.

Coal exploration and mining. Coal exploration and mining is subject to a dual registration system at state and provincial level. The MLR issues licenses for coal exploration blocks or production projects covering an area larger than 30 square kilometers (km²) while provincial land and resource agencies authorize smaller operations. Mining licenses for coal reserves exceeding 100 million tonnes and coking coal reserves exceeding 5,000 tonnes have to be issued by the MLR. In all other cases, provincial land and resource agencies are authorized to issue coal mining licenses.

As part of the administrative reform process that started in 2015, the MLR devolved authority over the coal industry, including approval thresholds, to provincial bureaus in three pilot provinces: Heilongjiang, Shaanxi and Guizhou (MLR 2015). Since then the land and resource bureaus in those three provinces have administered the approval, registration and transfer of coal exploration and

mining rights in their territories and have issued licenses for coal exploration and mining projects there. The lessons learned from these pilots will determine the next steps in liberalizing the coal markets of other provinces. In some cases, the MLR still has the power to suspend the approval of coal mining projects nationwide. This happened in 2016 when there was overproduction of coal in many provinces.

Coal-bed methane exploration and mining.

Investors that hold coal exploration licenses have the right to explore for both coal and coal-bed methane (CBM) resources. Companies can apply to the MLR for CBM mining rights if the concentration of CBM is higher than the national average and if the geology is appropriate for mining. Coal exploration and mining rights cannot be approved until CBM activities are completed. The MLR issues CBM exploration permits via a public bidding process. The MLR and the provincial land and resources bureaus cannot issue new mineral rights on the same block during the term of its CBM exploration and mining license.

New administrative measures issued by the MLR in 2007 have greatly reduced conflicts over coal and CBM rights in overlapping areas, disputes that often resulted from having separate approval authorities for the two mineral resources. According to the 2007 regulation, the MLR administers CBM mineral rights while provincial bureaus are in charge of most coal mining rights. But conflicts still exist. For example, in Shanxi Jincheng, coal mining rights are held by Jincheng Anthracite Coal Mining Group while CBM mining rights are owned by China United Coalbed Methane Corporation and PetroChina Coalbed Methane Company. This overlapping of mining rights has had a negative impact on the production of both coal and CBM. In order to further improve the administration of CBM development, the State

Council and the NEA issued new guidelines in 2013, establishing a coordination mechanism for coal mining and CBM mining at the provincial level (State Council 2013).

Oil and gas market access administration

China has historically maintained tight control over access to its oil and natural gas markets. On May 21, 2017 the government released an oil and gas industry reform plan, eyeing better efficiency and competitiveness by giving the market a decisive role in the sector. The plan reaffirmed the leadership's commitment to deepening the reform of state-owned oil and gas companies, encouraging eligible enterprises to diversify their shareholder base and introducing mixed-ownership reform. The reform focuses on pushing market-oriented transformation and covers different aspects of the value chain: exploration and exploitation; import and export management; pipeline reform; downstream competition; pricing mechanisms; SOE reform; storage; and environment and safety. The reform will be a gradual process and needs to strike a balance between social and economic needs. The following analysis captures the latest changes in market access administration along the industrial chain of oil and gas, which is subject to change according to the progress of reform.

Traditional oil and gas exploration. Oil and gas exploration and production is subject to Class 1 state administration. Enterprises can apply for exploration and production permits from the MLR after obtaining pre-qualification approval from the State Council. Only four state-owned oil companies (CNPC, Sinopec, CNOOC and Yanchang Petroleum) have so far pre-qualified for oil and gas exploration permits. Other enterprises can only obtain exploration and development rights by entering

into joint ventures with one or more of those four companies (Chen 2016). In 2015, as part of a pilot for the upstream reform of the oil and gas industry, four oil and gas blocks in Xinjiang were opened up for public bidding by the MLR. This was the first time exploration for conventional oil and gas was launched for local and private enterprises without the requirement for pre-qualification by the State Council. In 2017, another five oil and gas blocks in Xinjiang were publicly auctioned as part of the reform process.

CNPC, Sinopec, CNOOC and Yanchang Petroleum together own exploration rights for oil and gas blocks covering more than 4 million km². But many of these blocks have not been explored as planned. The transfer of exploration and production rights between companies, as well as an exit mechanism for inactive rights holders, are key issues that, if resolved, could encourage new investment in Chinese oil and gas exploration.

Shale Gas Exploration. Shale gas in China is currently listed as a mineral, independent from other resources, and subject to Class 1 state administration. The MLR is in charge of registering shale gas exploration and production rights, as well as coordinating exploration licenses with those of other mineral resources (MLR 2012). A public bidding process for shale gas exploration rights was launched in 2012 and saw the participation of both domestic and overseas investors, bringing with it a new form of transfer of rights for oil and gas. However, pre-qualification or a joint venture with a pre-qualified company is still required in order to undertake exploration activities. In 2016 the MLR issued Sinopec with the first production permit for the Fuling block in Chongqing municipality, signaling a milestone in the development of China's unconventional oil and gas reserves.

Over three-quarters (77%) of commercial shale gas reserves in China overlap with conventional oil and

gas blocks, the rights to which are mainly owned by Sinopec and CNPC. The potential conflict between different exploration and production rights will need to be resolved in future energy administration reforms. Under the current mineral resources legislation, the owner of exploration rights has priority over obtaining production rights. However, in practice, this priority is not properly implemented by some local governments when the project moves into the production stage. This negatively impacts exploration licensees, given the higher investment and higher risks involved in shale gas exploration compared with those associated with conventional natural gas exploration.

Crude oil imports. Imports of crude oil and petroleum products have long been under state control, with MOFCOM administering the crude oil and products import pre-qualification and quota allocation process. Crude oil imports through the state trading system have accounted for up to 90% of China's total oil imports. Five SOEs have obtained state trading pre-qualification for crude oil import rights, including China International United Petroleum & Chemicals, China National United Oil, Sinochem, CNOOC-Sinopec United Trade and Zhuhai Zhenrong. Local refineries are another emerging group of importers that need to apply for non-state trading pre-qualification from MOFCOM, a process subject to many requirements and procedures. In addition to requirements covering the availability of crude oil shipping and storage capacities (or rail port reloading capacity), potential importers also need to obtain licenses to use imported crude oil from the NDRC (MOFCOM 2017). In order to obtain a license to use imported crude oil, local refineries have to improve energy efficiency in production, close down outdated production capacity, or construct liquefied natural gas (LNG) storage facilities, following national industrial transformation and upgrading policies (NDRC 2015a).

As China's energy reforms evolve and rules are relaxed, local refineries have been able to count on an increasing range of sources for their feedstock. As of April 2018, 36 local refineries had obtained both import licenses and production licenses for crude oil (CNPC 2018). Previously, these local refiners had to rely on the five state-owned trading companies to import crude oil on their behalf.

Oil and gas pipelines. China's domestic oil and gas pipeline network has mainly been developed by CNPC, Sinopec and CNOOC. The point-to-point pipeline design linking oil and gas fields and the end user, typically the company itself, has created a natural monopoly. As a result, third-party access to the network is a major bottleneck for new investors in China's oil and gas industry, especially for shale gas producers. When China decided to open up the oil and gas pipeline network to third-party users in 2014, the challenge the NEA faced included not only the resistance of the three big oil SOEs but also the lack of spare capacity and limited ability to supervise pipeline operations. A more detailed scheme to create an independent operation for the oil and gas pipeline network is under discussion, following the 2017 reform plan for the oil and gas industry.

Oil products retailing. The oil products retailing industry is administered by MOFCOM, following the measures announced in 2006. Enterprises need to obtain licenses or need to be pre-qualified to undertake activities related to wholesale, retail and storage businesses. Some of these detailed requirements are listed later in this section. Separately, the design and construction of oil depots, pipelines and service stations is inspected and approved by the MLR, the Ministry of Public Security, the State Administration of Working Safety and the Ministry of Environmental Protection or their counterparts at the local level.

An enterprise applying for a crude oil sales license needs to be a production company that has received a petroleum production license approved by the State Council; a company that possesses a crude oil import license; or a company that has held crude oil supply agreements with another company in possession of a crude oil import license for at least one year.

An enterprise applying for pre-qualification to enter the oil products wholesale market needs to be an oil refinery with crude oil processing capacity above 1 million tonnes; a company with an oil products import license; or one that has an agreement with a company that has such a license.

An enterprise applying for pre-qualification to sell refined oil products on a retail basis needs to have an agreement valid for at least three years with a company possessing an oil products wholesale license.

An enterprise applying for pre-qualification for oil storage activities needs to have a crude oil depot with a storage capacity of at least 500,000 cubic meters, or an oil products depot with a storage capacity at least 10,000 cubic meters. Access to an oil transmission pipeline, special rail line or water transport terminal is required for both crude oil and oil products storage approvals.

Electric power market access administration

The New Business Pre-Qualification Administrative Center in the NEA manages market access for entrants to the electric power sector. Permits are required for power generation, transmission and

distribution. In line with recent reforms aimed at streamlining the government approval process, all decentralized power generation projects, renewable energy power plants, and waste heat recovery and power generation projects are either exempt from the requirement to obtain new business permits or go through a simplified procedure (NEA 2014). However, with the introduction of stronger controls on air quality standards, the supervision and administration of coal-fired plant business permits is closely linked with plants' environmental performance, particularly their emissions levels. Plants' permits can be revoked if they fail to meet the required environmental standards.

Given nuclear safety concerns and the special requirements of the nuclear power industry, China has set very strict market access rules relating to the shareholder structure of nuclear power plant owners. The National Nuclear Safety Administration (NNSA), an administrative unit of the MEP which is now under the control of the MEE, is responsible for approving nuclear power projects and for pre-qualifying and approving nuclear power equipment design and manufacturing. For its part, the NEA is responsible for rules covering market access. At present, only three corporations are authorized to operate in the nuclear power generation sector: China National Nuclear Corporation, China General Nuclear Power Corporation and the State Power Investment Corporation (SPIC). The merger of China Nuclear Power Technology Corporation and SPIC in 2014 automatically authorized the former. It is widely expected that the ongoing review of national nuclear power administration and regulation by the State Council will lead to an opening-up of the country's nuclear power sector. In particular, some centrally-administered SOEs with a shareholding of more than 25% in other nuclear power projects, and with proven nuclear business experience, will be allowed to take controlling stakes in nuclear power plants.

Power in Supervising Work Safety

The Ministry of Emergency Management (MEM), established in 2018, manages China's major emergency response and implements measures to improve public safety. The MEM has taken over the responsibilities of the former State Administration for Worker Safety (SAWS), along with functions from other ministries such as firefighting, disaster relief, geological disaster prevention, and drought and flood control. The new ministry is still integrating the emergency response system of the former SAWS and has sole responsibility for the inspection of work safety in non-coal mineral production activities. The MEM is also mandated to inspect and supervise safety on trans-province pipeline construction.

In addition to the MEM, 11 other government administrations also play an important role in overseeing China's oil and gas production. The NDRC and the NEA are in charge of the overall supervision of oil and gas pipeline safety as well as developing plans and standards for pipeline development. The SASAC is responsible for supervising the compliance of SOEs with national work safety regulations and standards. Replacing the former General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), the NMSA supervises the quality and safety of pipeline equipment. The MPS, MOF, MNR, MEE, MOHUR, MOT, and MWR are also involved in measures to avoid any adverse impacts on pipeline construction and operation safety from crime, environmental accidents, urban planning, land use, transport and water conservation projects.

As the world's largest coal producer and consumer, China has paid close attention to coal mining safety. The NCMSA was established in 1999 to oversee coal mine safety. Initially, it was part of SAWS but in 2005 it became an independent entity administered by SAWS. Following the government's

2018 reforms, the NCMSA is now administered by the MEM. The NCMSA specializes in developing policies, regulations and standards for coal mine safety. It also takes responsibility for regulating and supervising coal production and is involved in the coal mine project approval process. This centralized control over coal mining safety has sharply reduced the number of accidents and deaths in China's coal industry, which fell from a peak of 6,995 in 2002 to 375 in 2017 (Xinhua Net 2018a).

Following the 2013 merger of the SERC and the NEA, responsibility for electric power (excluding nuclear power) safety was transferred to a unit within the NEA. This unit drafts work safety regulations and policies for power production and transmission and supervises the enforcement of work safety regulations in these areas. It is also responsible for workplace safety supervision for hydroelectric dam construction and operation.

The supervision of nuclear power safety comes under the remit of the NNSA, which operates under the administration of the MEE. The NNSA is in charge of the supervision of design, manufacturing, installation and non-destructive tests of civilian nuclear safety equipment, as well as approving nuclear facility safety regulations (NNSA 2015). The State Administration for Science, Technology and Industry for National Defense (SASTIND), which operates under the aegis of the MIIT, supervises work safety at military nuclear facilities, including technology assessments, issuing relevant licenses and day-to-day safety supervision. There are some overlaps between the NNSA and the SASTIND on safety supervision of nuclear fuel, nuclear material and radioactive waste, as well as overlapping responsibilities between the NEA and the NNSA on nuclear personnel training and qualification (Li 2014). China's plan for a massive expansion of nuclear power poses challenges for these regulatory

bodies, which are not thought to have the ability to oversee such a big expansion in such a short period of time.

The involvement of all the aforementioned government agencies in energy sector work safety supervision reflects the Chinese government's focus on worker safety. However, a need was identified in the early 2000s for a higher-level body to coordinate efforts across the multiple administrations involved in the government's new

safety drive. Accordingly, the State Council Work Safety Commission was established in 2003 to coordinate actions among different work streams and to mobilize the resources needed to deal with major accidents. For example, to ensure the safety of oil and gas production, the Council defines the responsibilities of each government administration, ranging from supervising the enforcement of work safety standards to avoiding any negative impact from urban planning and other construction projects.

Conclusions

China's social and economic governance is characterized by a complex interplay between the CPC, the government and SOEs, a process that is constantly evolving. Likewise, the structure and processes of China's energy governance are similarly complex and are changing as it adapts to wider changes in the country's governing power structure.

Numerous reforms over the last 60 years have recognized the growing importance of energy in China's economic development and have led to a highly developed governance structure covering all elements of the value chain. Much, if not all, of the ultimate power over the energy sector is concentrated in the hands of the NEA and NDRC. However, numerous other government agencies are involved in formulating and implementing energy policy. One possible topic for further research would be to look at whether the functions of policymaking, policy implementation and regulation in China should be more clearly split.

Energy security has long been, and continues to be, at the top of the agenda for the party-state institutional structure, even at a time of plentiful global oil and gas supplies. The Chinese leadership's high-level road map to ensure long-term energy security is focused on four key elements: energy production, energy consumption, energy technology, and regulation. The key to success will depend on Beijing's ability to create a market-based pricing system for non-monopoly businesses while at the same time maximizing the economic efficiencies of China's natural monopoly businesses.

The complex energy project approval process and highly regulated market access rules remain as barriers to increasing investment in low-carbon renewable energy, despite recent efforts to relax the rules or devolve responsibility for them from central government to the provincial level.

References

- Andrews-Speed, Philip. 2010. *The Institutions of Energy Governance in China*. The Institute Francais des Relations Internationales (Ifri): Paris and Brussels.
- Andrews-Speed, Philip and Roland Dannreuther. 2016. *China, Oil and Global Politics*. Routledge Contemporary China Series. <https://doi.org/10.4324/9780203817896>
- Atkinson, Robert D. 2014. "ICT Innovation Policy in China: A Review." ITIF report, July. Accessed June 1, 2018. <http://www2.itif.org/2014-china-ict.pdf>
- Chen, Dongmei, Guangyun Fu, Nicholas Howarth, Alessandro Lanza, Padu S. Padmanabhan. 2018. "Toward Economic Prosperity Through Industrial Energy Productivity Improvement: A Saudi Arabia-China Joint Report." KAPSARC and ERI, Riyadh and Beijing, February. <https://doi.org/10.30573/KS--2018-DP28>
- Chen, Jiaru. 2016. "Analysis of China's Oil and Gas Policy in 2015." *China Oil & Gas* 23:8-15.
- Chen, Liuqin. 2017. *Qin's View on Energy Issue*. Beijing: Intellectual Property Press.
- Chen, Wenbo. 2015. "Does the Legislature Matter? The Executive-legislative Relations in Chinese Legislative Process." Paper for International Conference on Public Policies organized by International Public Policy Association, July 1-4, Milan. Accessed July 24, 2016. <http://www.icpublicpolicy.org/conference/file/reponse/1433976429.pdf>
- China National Petroleum Corporation (CNPC). 2018. 36 "Local Refineries Received Import Quota Close to 100 Million Tons." CNPC News, April 26. Accessed June 4, 2018. <http://news.cnpc.com.cn/system/2018/04/26/001688405.shtml>
- Cunningham, Edward A. 2015. "The State and the Firm: China's Energy Governance in Context." GEGI Working Paper, March. Accessed July 26, 2016. <https://ash.harvard.edu/files/chinas-energy-working-paper.pdf>
- Davies, Ken. 2013. "China Investment Policy: An Update." OECD Working Papers on International Investment. OECD Publishing. OECD Publishing. <http://dx.doi.org/10.1787/5k4691hmvbt-en>
- Downs, Erica Strecker. 2004. "The Chinese Energy Security Debate." *The China Quarterly*. 177:21--41. <https://doi.org/10.1017/s0305741004000037>
- Downs, Erica Strecker. 2008. "Commentary: China's New Energy Administration." *China Business Review*. November-December.
- Fang, Xiangliang, and Fangjing Ma. 2017. "Right Time, Uncertain Direction for Natural Gas Reform." *Caixing Global*, May 21. Accessed June 2018. <https://www.caixinglobal.com/2017-05-21/101093121.html>
- Garcia-Herrero, Alicia, Le Xia, and Carlos Casanova. 2015. "China's Outbound Foreign Direct Investment: How Much Goes Where After Round-Tripping and Offshoring?" Research paper of Banco Bilbao Vizcaya Argentaria (BBVA), June.
- Hu, Angang. 2013. *China's Collective Leadership System*. Beijing: China Renmin University Press.
- Lance, LP Gore. 2014. *Chinese Politics Illustrated: The Culture, Social, and Historical Context*. World Scientific Publishing Co.: Singapore. https://doi.org/10.1142/9789814546751_0011
- Li, Jingjing. 2014. "Proposal to Reform Nuclear Power Safety Supervision Administration." NRDC paper. http://www.nrdc.cn/news_center_flag.php?id=1428&cid=104
- Liang, Qi and Yuezhong Zhu. 2014. "Energy Security Strategy under the Background of National Security Commission." *Reform of China*.
- Lieberthal, Kenneth and Michel Oksenberg. 1988. *Policy Making in China*. Princeton, N.J.: Princeton University Press.
- Liu, Guoli. 2011. *Politics and Government in China*. Santa Barbara, C.A.: ABC-CLIO.
- Liu, Songshan. 2017. "Several Key Issues Need to Be Solved to Strengthen the Party's Leadership in Legislation." *Law Science* (Chinese) 5:3-11.
- McLean, Iain. 1987. *Public Choice: An Introduction*. Oxford, UK: Blackwell.
- Meidan, Michal, Philip Andrews-Speed, and Xin Ma. 2009. "Shaping China's Energy Policy: actors and processes." *Journal of Contemporary China* 18(61):591-616. <https://doi.org/10.1080/10670560903033885>

References

- Ministry of Land and Resources (MLR). 2012. "Notification of Shale Gas Exploration and Mining Administration and Supervision." Chinese government, Nov. 22. Accessed June 3, 2018. http://www.mlr.gov.cn/zwgk/zytz/201211/t20121122_1158928.htm
- Ministry of Land and Resources (MLR). 2015. "Notification of the Pilot for Administration and Approval Reform for Coal Mineral Rights." Chinese government, Aug. 24. Accessed June 4, 2018. http://www.mlr.gov.cn/zwgk/zytz/201509/t20150901_1365418.htm
- Ministry of Commerce (MOFCOM). 2017. "Announcement of Requirements, Procedures and Total Import Volume of Non-State Trading for Crude Oil in 2018." Chinese government, Nov. 6. Accessed June 4, 2018. <http://www.mofcom.gov.cn/article/b/e/201711/20171102667198.shtml>
- Mylyvirta, Lauri, Xinyi Shen, and Harri Lammi. 2015. "Consequences of Growing Investment on Coal Power Plants." Report of Greenpeace. <https://www.greenpeace.org.cn/wp-content/uploads/2015/11/The-consequences-of-coal-investment-in-china.pdf>
- National Development and Reform Commission (NDRC). 2015a. "Notification of Issue Related with the Use and Management of Imported Crude Oil." Chinese government, Feb. 9. Accessed May 31, 2018. http://www.sdpc.gov.cn/fzgggz/jjyx/zhd/201502/t20150216_664969.html
- National Development and Reform Commission (NDRC). 2015b. "Notification on Improving Coal-electricity Pricing Mechanism." Chinese government, Dec. 31. Accessed May 31, 2018. http://www.sdpc.gov.cn/fzgggz/jggl/zcfcg/201512/t20151231_770457.html
- National Development and Reform Commission (NDRC). 2016a. "Notification of Strengthening the Management to Hydropower Development in River Basin." Chinese government, Feb. 5. Accessed May 24, 2018. http://www.sdpc.gov.cn/zcfb/zcfbtz/201603/t20160324_795951.html
- National Development and Reform Commission (NDRC). 2016b. "Measures for Energy Conservation Evaluation and Review of Fixed-assets Investment Projects." Chinese government, Dec. 5. Accessed May 23, 2018. http://www.sdpc.gov.cn/fzgggz/hjbh/jnjs/201612/t20161205_829281.html
- National Energy Administration (NEA). 2014. "The Notification of Electricity Business Permit Administration." Chinese government, April 9. Accessed June 4, 2018. http://zfxgk.nea.gov.cn/auto84/201404/t20140422_1792.html
- National Energy Administration (NEA). 2016. "MWR and NEA Coordinate the Work for Water Conservancy and Energy Development." Chinese government, Feb. 19. Accessed May 24, 2018. http://www.nea.gov.cn/2016-02/19/c_135113057.htm
- National Nuclear Safety Administration (NNSA). 2015. "The People's Republic of China National Nuclear Safety Administration Annual Report." Accessed May 23, 2018. http://nnsa.mep.gov.cn/zhxx_8953/haqnb/201608/P020160830340792893561.pdf
- Paltsev, Sergey and Danwei Zhang. 2015. "Natural Gas Pricing Reform in China: Getting Closer to a Market system?" *Energy Policy* 86:43-56. <https://doi.org/10.1016/j.enpol.2015.06.027>
- Research Institute for Fiscal Science, Ministry of Finance (RIFS). 2015. "Climate Public Expenditure and Institutional Review in China." United Nations Development Programme, China. Accessed May 30, 2018. <http://www.cn.undp.org/content/china/en/home/library/south-south-cooperation/china-climate-public-expenditure-and-institutional-review.html>
- Rioux, Bertrand, Philipp Galkin, Frederic Murphy, Axel Pierru, Artem Malov, Felipe Feijoo Palacios, Yan Li, and Kang Wu. 2018. "The Economic Impact of Price Controls on China's Natural Gas Supply Chain." KAPSARC discussion paper. doi: <https://doi.org/10.30573/KS--2018-DP31>
- State-Owned Assets Supervision and Administration Commission (SASAC). 2016. "List of Central-government-administered SOEs." Chinese government, Dec. 20. Accessed May 24, 2018. <http://www.sasac.gov.cn/n86114/n86137/index.html>
- State Commission of Public Sector Reform (SCOPSR). 2008. "Notification of the Role and Responsibility of the MIIT." Chinese government, July 11. Accessed May 23, 2018. <http://www.scio.gov.cn/ztk/xwfb/jjfy/35081/jjjs35086/Document/1490727/1490727.htm>
- State Commission of Public Sector Reform (SCOPSR). 2013. "Notification Regarding the Responsibility and Institutional Setup of the National Administration of Energy." Chinese government, July 5. Accessed May 22, 2018. http://www.scopsr.gov.cn/rdzt/GWYXZJBMSDFAGB/GWYXSDGJNYJ/201307/t20130705_228975.html

- State Commission of Public Sector Reform (SCOPSR). 2015. "Notification about Adjusting the Role and Responsibility of the MIIT." Chinese government, April 20. Accessed May 23, 2018. <http://www.scio.gov.cn/ztk/xwfb/jjfy/35081/jgjs35086/Document/1490727/1490727.html>
- Shi, Xunpeng, Bertrand Rioux, and Philipp Galkin. 2018. "Unintended Consequences of China's Coal Capacity Cut Policy." *Energy Policy* 113: 478-486. <https://doi.org/10.1016/j.enpol.2017.11.034>
- State Council. 2004. "Decisions of the State Council on Investment System Reform." Chinese government, Aug. 12. Accessed May 30, 2018. http://www.gov.cn/zwzk/2005-08/12/content_21939.html
- State Council. 2013. "Opinions Regarding Advancing the Utilization of Coal-bed Methane." Chinese government, Sep. 14. Accessed May 30, 2018. http://www.gov.cn/zwzk/2013-09/22/content_2492302.html
- State Council. 2014a. "Opinions on Improving the Project Management and Funding Management for Central-Fiscal-Funded Research Programs." Chinese government, March 3. Accessed May 30, 2018. http://www.gov.cn/zhengce/content/2014-03/12/content_8711.htm
- State of Council. 2014b. "Notification on Releasing the Investment Project Category for Government Verification." Chinese government, Nov. 18. Accessed May 30, 2018. http://www.gov.cn/zhengce/content/2014-11/18/content_9219.htm
- State Council. 2014c. "Notification of the Scheme Deepening the Administration Reform for Central-Fiscal-Funded Research Programs." Chinese government, Dec. 3. Accessed May 30, 2018. http://www.most.gov.cn/tpxw/201501/t20150106_117285.htm
- State Council. 2015. "Opinions on State-owned Assets Administration System Reform." Chinese government, Nov. 4. Accessed May 30, 2018. http://www.gov.cn/zhengce/content/2015-11/04/content_10266.html
- State Council. 2017a. "The Administrative Approval Items that Have Been Cancelled and Delegated to Lower Levels by the State Council since 2013." Chinese government, Feb. 9. Accessed June 1, 2018. http://www.scopsr.gov.cn/xzspzd/tt/201702/t20170210_294618.html
- State Council. 2017b. "Notification of the Income of Environmental Protection Tax." Chinese government, Dec. 22. Accessed May 23, 2018. http://www.gov.cn/zhengce/content/2017-12/27/content_5250841.html
- State Council Work Safety Commission (SCWSC). 2015. "Notification of the Responsibility of Each Ministry on Work Safety." Aug. 27. Accessed June 4, 2018.
- Sun, Yun. 2013. "Chinese National Security Decision-making Processes and Challenges." The Brookings Institution, May. <https://www.brookings.edu/wp-content/uploads/2016/06/chinese-national-security-decisionmaking-sun-paper.pdf>
- World Bank. 1992. Governance and Development. Washington, DC: The World Bank.
- WWF China. 2008. "The 12th Five Year Plan: The Formulation of China's Major Plans and Programs 2008-2010 and Onwards." WWF report.
- Xinhua Net. 2018a. "375 Deaths from 219 Coal Mining Accidents in 2017." Chinese official media, Jan. 29. Accessed June 12, 2018. http://www.xinhuanet.com/fortune/2018-01/29/c_1122336631.htm
- Xinhua Net. 2018b. "Lead the Ship of China's Economy: Xi's Leadership of the CPC through the Lens of the CPC Leading Group Meetings." Chinese official media, March 31. Accessed April 23, 2018. http://www.xinhuanet.com/politics/2018-03/31/c_1122619515.htm
- Zhang, Shawn and Xuqing Qiu. 2015. "Lessons learned from China's Residential Tiered Electricity Pricing Reform." IISD paper, April. Accessed May 31, 2018. <http://www.iisd.org/library/lessons-learned-chinas-residential-tiered-electricity-pricing-reform>

A green geometric graphic consisting of several overlapping triangles of different shades of green, located in the top-left corner of the page.

Notes

Notes

A green geometric graphic consisting of several overlapping triangles of different shades of green, located in the top-left corner of the page.

Notes

Appendix 1: Approval Authorities for Energy Projects in China (2004-2014)

Project type	Approval Authority in 2004 (State Council 2004)	Approval Authority in 2014 (State Council 2014)
Hydropower plant	Verified by the NDRC: projects on major river, total installed capacity above 250 MW	Verified by the State Council: station with total installed capacity above 3 GW or involved immigrants move than 10,000 people. Verified by the NDRC/NEA: station with installed capacity above 500 MW on transboundary rivers or trans-province rivers.
Pumped-storage power plant	Verified by the NDRC	Verified by the provincial DRC
Coal-fired power plant	Verified by the NDRC	Verified by the provincial DRC, under national coal cap plan
Thermal power plant	Verified by the NDRC: only coal-fired thermal plan	Verified by the provincial DRC: only pumping condensing type Verified by the local DRC: Rest type
Wind power plant	Verified by the NDRC: only total installed capacity above 50 MW	Verified by the local DRC: under national construction plan
Nuclear power plant	Verified by the NDRC	Verified by the State Council
Grid construction project	Verified by the NDRC: above 330 kV	Recorded by the State Council: DC grid project above 800kV and AC grid project above 1000kV Verified by the NDRC/NEA: DC grid project transboundary or trans-province (region or city) above 500kV, AC grid project of 500kV, 750kV and 1000kV transboundary or trans-province (region or city)
Coal mining project	Verified by the NDRC: only projects in national-planned coal mining area	Recorded by the State Council: project with new-added annual production capacity above 5 million tonnes in the national-planned coal mining area Verified by the NDRC/NEA: projects with new-added annual production capacity above 1.2 million tonnes in the national-planned coal mining area Verified by the provincial DRC: Other types in the national-planned coal mining area

Appendix 1: Approval Authorities for Energy Projects in China (2004-2014)

Coal to liquid project	Verified by the NDRC: annual production capacity above 0.5 million tonnes	Verified by the NDRC/NEA: annual production capacity above 1 million tonnes for CTL, and annual production capacity above 2 billion cubic meters for coal to gas
Oil field development	Verified by the NDRC: annual production capacity above 1 million tonnes	
Natural gas field development	Verified by the NDRC: annual production capacity above 2 billion cubic meters	
LPG receiving and storage	Verified by the provincial DRC	Verified by the provincial DRC
Imported LNG receiving and storage	Verified by the NDRC	Recorded by the State Council: project with new capacity above 3 million tonnes Verified by the NDRC/NEA: only new project and expansion project in a different area verified by the provincial DRC: Remainder
Crude oil storage	Verified by the NDRC	
Oil pipeline	Verified by the NDRC: trans-provinces project	Recorded by the State Council: transboundary project Verified by the NDRC/NEA: transboundary project, trans-province project verified by the provincial DRC: Remainder
Gas pipeline	Verified by the NDRC: Trans-provinces project or annual transmission capacity above 500 million cubic meters	Recorded by the State Council: transboundary project Verified by the NDRC/NEA: transboundary project, trans-province project verified by the provincial DRC: Remainder
Oil refinery		Verified by the NDRC/NEA: new refinery project or extension project of primary processing of crude oil Verified by the provincial DRC: other expansion projects under national energy plan and petrochemical industry plan
Blended ethanol fuel		Verified by the provincial DRC

Appendix 2: Acronyms

APEC: Asia-Pacific Economic Cooperation
AQSIQ: General Administration of Quality Supervision, Inspection and Quarantine
ASEAN: Association of Southeast Asian Nations
BRI: Belt and Road Initiative
CAAC: Civil Aviation Administration of China
CAS: Chinese Academy of Science
CBRC: China Bank Regulatory Commission
CEC: China Electricity Council
CGN: China General Nuclear Power Corporation
CMC: Central Military Commission
CNNC: China National Nuclear Corporation
CNOOC: China National Offshore Oil Corporation
CNPC: China National Petroleum Corporation
CNPTC: China Nuclear Power Technology Corporation
CNSC: Central National Security Commission of the CPC
COSTIND: Commission of Science, Technology and Industry for National Defense
CPC: Communist Party of China
CPCIF: China Petroleum and Chemical Industry Federation
CPPCC: Chinese People's Political Consultative Conference
CSRC: China Securities Regulatory Commission
DRC: Development Research Center
ECT: Energy Charter Treaty
ERI: Energy Research Institute
IDCA: International Development Cooperation Agency
IEA: International Energy Agency
IEF: International Energy Forum
MEE: Ministry of Ecology and Environment
MEM: Ministry of Emergency Management
MEP: Ministry of Environmental Protection
MFA: Ministry of Foreign Affairs
MIIT: Ministry of Industry and Information Technology
MLR: Ministry of Land and Resources
MNR: Ministry of Natural Resources
MOA: Ministry of Agriculture
MOF: Ministry of Finance
MOFCOM: Ministry of Commerce

Appendix 2: Acronyms

MOHRSS: Ministry of Human Resources and Social Security
MOHURD: Ministry of Housing and Urban-Rural Development
MOST: Ministry of Science and Technology
MOT: Ministry of Transportation
MPS: Ministry of Public Security
MSS: Ministry of State Security
MWR: Ministry of Water Resource
NCMSA: National Coal Mine Safety Administration
NDRC: National Development and Reform Commission
NEA: National Energy Administration
NEC: National Energy Commission
NGO: Non-governmental organization
NMSA: National Market Supervision Administration
NNSA: National Nuclear Safety Administration
NPC: National People's Congress
PBC: People's Bank of China
PSC: Politburo Standing Committee, CPC
PLA: People's Liberation Army
Provincial DRC: Provincial Development and Reform Commission
SAFE: State Administration of Foreign Exchange
SAIC: State Administration for Industry and Commerce
SASAC: State-Owned Assets Supervision and Administration Commission
SASTIND: State Administration of Science, Technology and Industry for National Defense
SAT: State Administration of Tax
SAWS: State Administration of Work Safety
SBMS: State Bureau of Surveying and Mapping
SCO: Shanghai Cooperation Organization
SCOPSR: State Commission of Public Sector Reform
SCWSC: State Council Work Safety Commission
SERC: State Electricity Regulatory Commission
SFDA: State Food and Drug Administration
SOA: State Oceanic Administration
SOE: State-owned enterprise
SPIC: State Power Investment Corporation
UNFCCC: United Nations Framework on Convention on Climate Change
WEC: World Energy Council
WTO: World Trade Organization

About the Authors

Dongmei Chen

Dongmei is a research fellow in the Market and Industrial Development Program at KAPSARC. She has more than 20 years working experience in the energy and climate field in China, acting as Head of the Institute of Industrial Productivity China Office and Director of Climate Change and Energy Program for WWF China before she joined KAPSARC.

Paul Mollet

Paul is a research fellow in the Policy and Decision Sciences program. He is an analyst with over 25 years of experience covering international oil and energy markets. Paul has attended numerous OPEC meetings and written extensively about the oil industry in publications such as Platts Oilgram News, Argus Global Markets, and Petroleum Economist.

Brian Efird

Brian is the program director for Policy and Decision Science at KAPSARC. This program encompasses a multi-disciplinary, multi-national team of researchers who focus on collective decision-making processes, demography and energy, and energy policy studies of countries in the GCC region.

About the Project

This project aims to produce policy relevant insights that may assist actors outside China to understand the oversight and process for governing China's energy sector. The structures and processes outlined in this project will inevitably continue to evolve and change as the country undergoes further economic transition and energy transition. A continued discussion and updated knowledge can help to answer a range of questions for China's future energy economy.

www.kapsarc.org