7 The political economy of coal

The case of China

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Introduction

China exceeds all other countries in annual energy use and greenhouse gas emissions (Sandalow 2018). The carbon intensity of China's economy (i.e. the carbon dioxide emissions per unit of GDP) is also relatively high due to the use of abundant and low-cost domestic coal resources. Given massive domestic coal reserves, China uses more than half and produces just less than half of the world's coal. Therefore, it is by far the world's largest consumer and producer of coal.

The electric power sector is the main destination for coal in China, accounting for 48% of coal use (Zhou et al. 2020). China has a total installed capacity of 2,200 GW (National Bureau of Statistics 2021). In 2020, China generated 7.8 million GWh of electricity, with 56.8% of that coming from coal-fired power plants. Other major end uses of coal include the industrial sector, heating supply, and buildings, which account for 40%, 7%, and 5% of total coal consumption, respectively (Zhou et al. 2020).

As a result of this coal-heavy economy, China is also the world's largest CO₂ emitter. China's annual CO₂ emissions surpassed those of the United States in 2005. More than 70% of CO₂ emissions in the industry and electric power sectors come from coal combustion (Korsbakken et al. 2018).

Most of China's coal reserves are in north, northwest, and southwest China, while demand centers are on the eastern coast (Tu 2011). The coal sector employs about 5 million workers, with Shanxi province having by far the greatest number of coal-mining workers. Figure 7.1 shows coal-mining employment by province, as well as the gross regional product of each province.

The massive scale and varied geography of China's coal sector play a role in the formulation of the country's energy policies, as do the various actors that engage with the coal sector. As China increasingly commits to low-carbon transformation and energy transition, it is critical to understand the political economy factors that influence the ongoing development of China's coal sector. In addition to pressure from climate goals, another key contextual factor is the overcapacity of coal-fired power generation and other major coal-consuming industries.

Coal Mining Employment and GDP by Region (2015)

Figure 7.1 Coal-mining employment and gross regional product by province, 2015.

Source: National Bureau of Statistics of China (2019), China Statistical Yearbook (2019), NRDC (2018)

We apply the AOC (“actors, objectives, context”) framework developed by Jakob et al. 2020 covered in Chapter 1 to examine the contemporary political economy of China’s coal sector. This framework addresses three key research questions: what are the objectives present in China’s energy policy domain? What actors represent these objectives? How do the socioeconomic, political, and institutional contexts shape these objectives? Following this framework, we conducted a literature synthesis on the political economy of China’s coal sector to identify the relevant actors, objectives, and contextual factors. We began the literature review by focusing on studies that develop theories of political economy for China’s coal sector, energy policy, and climate policy and deepened the review by searching for empirical studies with primary quantitative and qualitative data on China’s coal sector, as well as reviewing Chinese policy documents. The literature review was supplemented with key expert interviews to verify and extend our synthesis of the information based on informational gaps in the literature review, such as the current state of carbon capture and sequestration technology and policy; the link between domestic coal overcapacity and overseas industrial policy; and the role of industry groups in coal

policymaking. We identified and interviewed seven experts between January and November 2020, based on their known expertise in subject areas we were seeking to improve our information on and a snowball approach through our networks. We included notes from these interviews as primary information to supplement our synthesis approach.

Key actors

Policies that govern the coal sector emerge from a complex set of interplaying objectives on the part of a diverse set of actors (Jakob et al. 2020). In this section, we divide the actors that engage with China's coal sector into political and societal actors, describe their main functions, and outline the ways in which they influence policymaking.

Political actors

The Chinese Communist Party (CCP) is the sole governing political party of the country, setting national strategies for economic development and, in recent years, a rhetoric of environmental protection. Coal has played a key role in fueling industrialization throughout the various phases of China's economic development. Under Mao, coal was a core industry with well-paid workers and low, controlled prices that were meant to boost industrialization with cheap fuel inputs. Over the next few decades, national leaders' strategy of promoting reform and dualism meant that coal production was bifurcated into small township and village coal mines (TVMs) that sold coal on a market basis, and state-owned enterprises (SOEs) with a regulated price system. Since the Reform and Opening Up era beginning in 1978, the government has pursued a market or capitalist approach to coal production, but this has come into tension with the electricity generation industry, for which reform and deregulation is ongoing (Wright 2012). Under Hu Jintao and Xi Jinping, a prominent rhetoric of ecological civilization (*shengtai wenming*) has been promoted to unite the goals of economic development and environmental sustainability, and this high-level commitment to environmental protection has led to increasingly stringent regulation of the coal industry. The specific actors that implement and enforce these high-level strategies and goals are discussed below.

National Development and Reform Commission (NDRC)

The National Development and Reform Commission (NDRC) is a super-ministry that sits a half rank above China's other ministries, responsible for broad development and economic planning. The NDRC prepares China's national Five-Year Plan and sets national benchmark prices for a range of commodities, including coal and oil. In 1998, the former Ministry of Coal was phased out and its functions transferred to the NDRC (Peng 2009). The NDRC has the

power to set energy pricing and to review and approve infrastructure projects throughout China as well as overseas.

National Energy Administration (NEA)

The National Energy Administration (NEA) is an independent agency within the NDRC in charge of energy planning and policy coordination. The NEA studies and drafts energy development strategies, implements policies in industrial sectors, and is responsible for promoting energy efficiency. For example, the NDRC and NEA created the risk warning system for coal-fired power plants in 2016, effectively restricting which provinces could construct new coal plants.

Ministry of Ecology and Environment (MEE)

The Ministry of Ecology and Environment (MEE) is responsible for developing, implementing, and coordinating China's climate change policies. Notably, it is responsible for establishing the national carbon trading system and, with the NDRC, developed China's first nationally determined contributions (NDC) for the Paris Agreement on climate change. Formed in March 2018, this body consolidated environmental responsibilities formerly spread across a number of ministries, including climate change and emissions reduction policies formerly under the NDRC. Its formation elevated environmental policy to equal status with economic policies, represented by the agency being at the same level as the NDRC and other ministries in reporting directly to the State Council. However, being a new body without the historical influence of the NDRC, the MEE has a lower rank in China's cabinet hierarchy and less power over Five-Year Plans and sectoral policy. In energy and climate policy, the lead agency remains the NDRC.

Subnational government

State organization is paralleled at all levels of government, with provincial and municipal DRCs exercising powers on behalf of local government. Provincial benchmarking price-setting is informed by national benchmarks set by the NDRC. Similarly, national climate targets are implemented in part by assigning targets to provinces, with provincial and local leaders accountable for achieving them. As such, subnational governments, including provincial and municipal officials, have significant power to set the local climate policy agenda. Failure to achieve environmental targets became a potential barrier to promotion for officials for the first time in the 11th Five-Year Plan (2006–2010), although economic targets remain the most important metric for promotion evaluation (Sandalow 2018). These competing incentives were tested from 2014 to 2016, when new coal plant approval was transferred from central government to the provincial level, leading to 210 project approvals in the span of a year, even as demand declined (Myllyvirta 2020).

State-owned Assets Supervision and Administration Commission of the State Council (SASAC)

State-owned Assets Supervision and Administration Commission of the State Council (SASAC) supervises and manages SOEs, including China's large power companies and oil and gas companies. SASAC has the power to appoint, evaluate, and remove executives of the enterprises it supervises, and it can also restructure and reorganize these enterprises in support of policy goals. Although SASAC can integrate and restructure SOEs, it has limited direct influence over energy policy.

State-owned enterprises (SOEs)

The Chinese government retains control over “strategically important” industries, including energy via SOEs. These can have national or subnational ownership and employ some 61 million people as of 2018 (Hart et al. 2019). While not directly involved in policy formulation, some SOEs play an important role in informing state investment decisions. For example, many SOEs receive state financial support to develop low-carbon technologies, which informs policymakers as to what is technologically and economically feasible. Many national SOEs have quasi-regulatory authority through their ability to adopt rules governing operations, a legacy of prior status as state bodies before corporatization. A revolving door of top executives and bureaucrats among SOEs and government agencies ensures strong lobbying influence and a conflict of interest between the regulator and regulated. Subnational SOEs are local governments' most significant tax revenue source with taxes collected accounting for approximately 90% of local revenue (Hart et al. 2019). Combined with their ability to choose where within China to operate, SOEs have strong influence over local policy. Examples of SOEs that play a major role in the coal sector are the so-called Big Five electric power generation companies, which SASAC has increasingly consolidated over the years. China Energy Investment Corporation (CEIC) is China's largest power producer. It operates in eight business segments, including coal mining, thermal power, transportation, and clean energy. CEIC owns China Shenhua Energy Co. Ltd, the world's largest coal company. Shenhua first emerged as an SOE directly administered by the State Council in the 1980s and steadily increased vertical integration in the coal sector until SASAC merged it with CEIC in 2017 (Peng 2009). The other major SOEs that round out the “Big Five” are Datang Group, Huadian Corporation, Huaneng Group, and the State Power Investment Corporation.

Societal actors

Private coal companies

The private coal sector is significantly smaller than SOEs, to the point of not being competitive domestically, especially after continued consolidation of

SOEs. The majority of private business streams are moving to international projects. For example, China Kingho, the largest private coal-mining company in China, has projects in Mozambique, Sierra Leone, and Pakistan.

Expert organizations

These include Chinese academies, such as the Chinese Academy of Science, and top national universities, particularly those in Beijing with access to government officials. These are supported by government funding sources but operate relatively independently and openly. They influence policy through their expertise and ability to inform and legitimize political and economic positions. In addition to academic organizations, there are several quasi-governmental research institutions that also provide research and analysis support that informs the development of Chinese energy and climate policy. These include the National Center for Climate Change Strategy and International Cooperation (NCSC, founded under NDRC and transferred to MEE), the Energy Research Institute (ERI, part of NDRC), and more.

Major coal-consuming industries

End users of coal in China, like the iron and steel industry, have historically benefited from low coal prices. These industries will be affected by various coal-related policies, including the coal cap, emissions regulations like China's emissions trading system (ETS), and China's carbon neutrality target.

NGOs

These can be divided into three categories: government-sponsored NGOs, grassroots NGOs, and international NGOs. Roles include government engagement and raising public awareness. Government-sponsored NGOs, sometimes known as government-organized NGOs (GONGOs), have the most policy influence, but all face a restricted political space. During the mid-2000s, most pollution-related civil society activity was directed by state-sponsored or state subcontracted nonprofit organizations, which served as an extension of the CCP's policy research institutions (Chen et al. 2013). GONGOs are not independent from the state, nor are they deeply connected to grassroots movements, and thus usually abstain from "radical confrontation" with or explicit protest against the national government (Fei 2015). The first set of Chinese environmental GONGOs emerged during the first phase of Deng Xiaoping's Reform era. In 1979, the government sponsored the Chinese Society of Environmental Science (CSES), a GONGO that established a framework wherein the public could "openly" discuss environmental issues and policy solutions with CCP authorities. Today, NGOs are not officially consulted in the construction of NDCs and price-setting but may have influence through relationships with expert organizations. A handful of domestic NGOs are actively advocating for

decreased coal use in China. A number of international NGOs have offices in China and pursue similar advocacy goals, including the Natural Resources Defense Council, the World Resources Institute, and Greenpeace. However, international organizations are subject to increasingly strict oversight.

Objectives

In recent years, several trends have emerged in China's coal industry, including massive overcapacity of coal-fired power generation, the facilitation of coal power developers going abroad via the Belt and Road Initiative, a high-level commitment to emissions reduction and clean energy transition within China, and ongoing issues with provincial-to-national economic and environmental reporting. These clear trends reflect a diverse set of objectives on the part of the actors discussed above.

In this section, we identify and cluster the objectives of the above actor groups into several themes: economic development, economic reform, and clean energy and environmental governance. Each of these objectives exerts different pressures on decision-making for China's coal sector.

Economic development

Economic growth is the foundation of the Chinese government's political legitimacy. Since the Reform and Opening Up era, China has seen rapid economic development, a subsequent growth in the middle class, and a rise in energy consumption. China's economic growth has been driven by coal as its dominant source of both primary energy and electricity supply. In 2011, China became the world's second-largest economy, with its GDP at US\$7.2 trillion.

However, as economic growth in China slows, there is a growing gap between the growth rate of installed coal capacity (7.8%) and electricity demand (0.5%) (Ming et al. 2017), a problem referred to as overcapacity. By some estimates, China has around 200–260 GW of excess coal capacity (Yuan et al. 2016). Since 2017, the NEA has canceled more than 200 GW of planned coal-fired power generation capacity, yet more projects continue to be approved, even in 2020.

This severe overcapacity issue has been driven by a mandate for economic development. At a broad scale, China's coal overcapacity problem is a result of the need to maintain massive flows of capital investment that signal economic growth in a political sense. Incentive structures for local governmental officials to promote rapid economic development have been in place since the early Reform era. Major investment in electricity supply was needed to meet booming energy demand that began in the 2000s, and coal was seen as a pillar for domestic energy security. Incentives for local officials included policies like national subsidies for manufacturing to stimulate local growth and personal incentives for local leaders (i.e. CCP recognition and promotions to national government). Investment in coal mines and coal-fired power plants directly boosted provincial GDP. Coal was particularly favored over other energy

sources because many local government officials were also on company boards of manufacturing companies and SOEs for coal production that operated in provinces or municipalities that they governed (Rogers and Vogel 2018).

Today, coal-fired power plants continue to be seen as a familiar and reliable investment within China for provincial economic planners. Overcapacity has been driven not by energy security concerns, but by a policy shift. In 2014, the approval authority for coal power projects was decentralized and shifted from the central government to local governments, and approval time was shortened (Ren et al. 2019). Provincial-level government officials have traditionally been evaluated by the central government based on economic performance. With project approval for coal-fired power plants decided upon at the provincial level, provincial governments have an incentive to keep approving coal plants even when the capacity is not needed (Feng et al. 2018). In addition to misalignment between national policy and local interests, our literature review also finds that overcapacity is attributed to misguided regulatory practices that guarantee rates of return for coal plants, timing misalignment in the adjustment of regulated prices for coal and electricity, and mistaken assumptions about the economy.

This excess capacity is not unique to the coal sector – many other coal-intensive industries, such as steel and aluminum, also face domestic overcapacity due to years of rampant and uncoordinated investment, which has driven continued high demand for coal. This overall industrial overcapacity represents enormous investment waste, low returns for many individual plants, and difficulty in achieving environmental targets. However, through industry groups, China's coal enterprises continue to promote coal as essential to energy security and power system reliability in order to maintain their market share.

The high-level mandate to continue economic growth also means delivering continually rising living standards for Chinese citizens, especially via the labor market. Traditionally, employment in China's coal-mining sector provided well-paid but dangerous jobs for millions of workers, peaking at over 5 million workers in coal mine enterprises in 1990 (Wright 2012). As China manages a transition to clean energy, there will be significant effects on workers employed in the coal industry, a major issue for other coal-producing countries considering energy transitions such as India, the United States, and Poland. The negative effects of closing unneeded coal plants and coal mines have also disproportionately affected the poorer interior provinces and workers in less urban areas (Hao et al. 2019). Additionally, other coal-capacity-cut programs resulted in unemployment and regional economic decline (Shi et al. 2018). These effects are of concern to central government leaders in terms of how they might affect economic development in relation to political stability, given the entrenched political power of the coal industry and the importance of avoiding mass unemployment in key regions.

The contribution of the coal sector to China's economic development also hinges on the trajectory of China's renewable energy industry as an alternative to coal power. China's domestic solar and wind manufacturers are competitive on a global stage, and equipment export has been a major growth area

for domestic renewable energy companies. China's domestic renewable energy target and other climate policies will also create a favorable policy environment for increasing installation of renewable capacity. Renewable energy companies tend to be private companies operating on a much smaller scale than the traditional SOEs that are involved in coal mining and coal power development, which has meant they have not wielded the same political power. However, the major SOEs are increasingly getting involved in renewable energy development as part of an asset diversification strategy. In addition, given China's ambitious climate policies, SOEs are receiving pressure from the national government to innovate in technologies besides renewable energy that enable low-carbon industry, including energy storage, ultrahigh voltage transmission, smart grids, and carbon capture and storage (CCS). CCS can be paired with coal-fired power generation to significantly reduce CO₂ emissions and may be of particular interest to SOEs now facing competing objectives of ensuring that their existing coal projects do not become stranded investments while also meeting carbon reduction targets. These SOEs continue to hedge on coal by supporting other technologies that can prolong coal's high market share, like coal-to-gas development.

Box 7.1 The Belt and Road Initiative, economic development, and coal

The Belt and Road Initiative (BRI) is portrayed as an important new model for global economic development, led by China (Hofman and Ho 2012), but it also facilitates further economic opportunities for Chinese firms in overseas markets. The BRI strategy helps Chinese companies access new markets, maintain profitability, and solve the issue of industrial unemployment and slowing growth within China (Inskeep and Westerman 2019). Domestic coal plant technology developers have benefited from China's involvement in coal plant development overseas (Shearer et al. 2019). Demand for coal power development in BRI host countries has driven financing for overseas coal power plants from China's policy banks (Gallagher et al. 2021). China's involvement in overseas coal power has led to significant backlash from international NGOs and Western development finance institutions due to the climate and environmental impacts of a lock-in of coal infrastructure.

Economic reform

From a political economy perspective, it is important to distinguish between economic development and economic reform in China, although both processes are inextricably linked. Economic reform refers to the transition in economic structure and management that has taken place over the past few decades in China, and which continues to be a major goal of economic policymakers. In

the late 1970s and 1980s, China's Reform and Opening Up process was remarkably "unplanned" in the sense that it lacked a preordained, top-down structure. The reforms occurred through a dual-track system that allowed coexistence of the traditional planned economy as well as a market channel at the firm level (Naughton 1995). Yet the reforms did not eliminate planning altogether. From the 1990s onward, Chinese planning changed in its nature, becoming more of an iterative, responsive coordinating mechanism rather than an overall command system (Heilmann and Melton 2013). China's efforts to partially transition to a market economy have had significant implications for the coal sector. Both large, national coal-mining SOEs as well as smaller TVMs struggled with the transition to a market economy (Wright 2012). TVMs, which were allowed to transition to a market pricing system, received the bulk of criticism related to the environmental and social costs of coal mining, while SOEs struggled with mandated low coal prices that reduced incentives for investment and efficiency. Over time, as reform has continued, power over the coal-mining industry has increasingly consolidated within the national SOEs (Peng 2011). In recent years, the geography of China's coal production has been driven in part by a "strategic westward movement" promoted by the central government in order to further consolidate resources in larger firms and upgrade production (Woodworth 2015).

In addition to coal production, the electric power sector has been a target for reform and marketization since 2015. The electric power sector is the main destination for coal in China. The main goals of reform are to increase generation efficiency, decrease consumption and pollutant emissions, develop renewable energy, and decrease industrial electricity prices (Guo et al. 2020, Victor and Heller 2007). In China, residential electricity prices are heavily subsidized, in part to maintain social and political stability. However, industrial electricity prices are higher than those of most developing countries and even some developed countries. Premier Li Keqiang set a goal of reducing the price of industrial and commercial electricity by 10% in 2018, 10% in 2019, and 5% in 2020 (Li 2018, 2019, 2020). Prior to 2015, the sector operated in a single purchasing agency model where one grid company (State Grid or the Southern Power Grid) purchased electricity from generator companies and sold to consumers at regulated prices. Under this model, wholesale electricity markets were not competitive in structure, meaning that the marginal cost of producing electricity did not determine the electricity price or the dispatch order for power generators (Kahrl et al. 2013). Low-cost renewable energy has often been curtailed due to system balance concerns and limited transmission capacity despite being legally prioritized in transmission and distribution by the NEA. This has slowed a transition away from coal-fired power generation. In 2015, new reforms were introduced to enhance market-based competition by creating competitive wholesale and retail markets. As of 2018, all provinces in mainland China have established power exchange centers to support market-based electricity transactions. On top of these provincial markets, six regional power markets exist for interprovincial transmission. Interprovincial

and interregional transmissions remain low as they face hurdles, including low density of connections between networks and highly diverse market models across jurisdictions (Guo et al. 2020).

These reform efforts embody a contradictory logic wherein policymakers claim to want competition, foreign investment, and privatization while still setting prices, limiting foreign ownership, and keeping state-owned power generation companies in the hands of small political networks, especially those with vested interests in coal power (Yeh and Lewis 2004). In particular, the long-term tension between coal production and coal-fired electricity generation, referred to as *mei dian zhi zheng*, continues. Given low residential electricity prices, electricity generators seek low-cost fuel inputs, while coal producers desire a higher price for their product. This tension has led to increased vertical integration of the coal sector, without resolving the underlying economic contradictions.

Clean energy and environmental governance

In recent years, a number of policies have been set forth in order to regulate the environmental impacts. The State Council issued the Energy Development Strategy Action Plan in 2014, which set a target for national coal consumption at 4.1 billion tons per year by 2020, which many experts agreed was not a particularly stringent cap, given a plateau in coal consumption at around 3.7–3.8 billion tons per year beginning in 2013. However, regional coal consumption caps are more stringent. In 2016, the NDRC and NEA released guidelines that required 13 provinces and regions with growing coal overcapacity to halt approval of new coal projects. The NEA also established a warning system that evaluated risk of overcapacity for provinces and led to the cancellation of dozens of plants in provinces deemed high risk (Lin et al. 2016).

The 13th Five-Year Energy Development Plan, released by the NDRC in 2016, set a target for coal to provide no more than 58% of primary energy by 2020. In 2017, the NDRC announced a new limit on total installed coal-fired generation capacity of 1,100 GW. At the same time, there are a number of environmental laws and plans that regulate the coal sector, such as the State Council's 2013 Air Pollution Prevention and Control Action Plan, the 2015 Environmental Protection Law, and the 2017 Environmental Protection Tax Law. The national ETS will regulate CO₂ emissions in the form of a tradable performance standard that will be first applied to the power sector, and eventually expand to other major emitting sectors that will account for over half of China's CO₂ emissions (Goulder et al. 2017). While not a traditional carbon price that would directly increase the cost of coal for end users, depending on a number of policy design features, the national ETS could incentivize deployment of lower carbon fuel sources in regulated sectors, especially if pursued in tandem with sectoral reform and marketization efforts (Myllyvirta and Slater 2021). Table 7.1 summarizes the key energy and environmental policies regulating coal sector.

Table 7.1 Key energy and environmental policies affecting China's coal sector

<i>Policy</i>	<i>Description</i>	<i>Implementing agency</i>
Air Pollution Prevention and Control Action Plan	Called for elimination of small coal-fired boilers, energy efficiency standards for large coal-fired boilers, and steps to address air pollution from coal	State Council
Energy Development Strategy Action Plan	Capped national coal consumption at 4.1 billion tons per year and 62% of primary energy mix by 2020	State Council
13th Five-Year Energy Development Plan	Capped national coal consumption at 4.1 billion tons and 58% of primary energy by 2020	NDRC
National CO ₂ emissions trading system	Tradable performance standard first applied to the power sector, to eventually expand to other major emitting sectors	MEE
Top 100, 1000, and 10,000 Energy-Consuming Enterprises Program	Companies in the program are required to meet energy consumption reduction targets. Specific targets are based on annual energy consumption	NDRC
Carbon Neutrality by 2060	Peak CO ₂ emissions by 2030 and achieve carbon neutrality by 2060. Peak coal consumption by 2025	NDRC
Regional coal consumption caps	Early warning system for controlling overcapacity. Tightened control of coal power expansion by region, ordering construction projects to be slowed down, postponed, or canceled	NDRC, NEA
14th Five-Year Energy Development Plan	13.5% reduction in energy intensity and 18% reduction in carbon intensity in 2021–2025 period. Coal cap expected to be announced late 2021	NDRC

Coal drives the high carbon intensity of China's economy, although major energy efficiency policies have reduced the carbon intensity of the economy significantly in the past decade. In the past ten years, China's central government has committed significant political will and resources to developing clean energy technology and policy aimed at reducing greenhouse gas emissions. From the 11th Five-Year Plan (2006–2010) onward, binding energy efficiency and emissions intensity targets have been put forth in China's Five-Year Plans. China has also made voluntary energy and emissions commitments in other high-level policy venues, such as the UN climate negotiations, where these targets were formalized in their Intended Nationally Determined Contributions (INDCs). Most recently, China committed to carbon neutrality by 2060, as well as peak coal consumption by 2025 at the Leaders Summit on Climate in

April 2021. Given the global nature of climate change, China's greenhouse gas emissions reduction efforts reflect an increasing desire to demonstrate global leadership and enhance international soft power.

However, nationally guided emissions reduction efforts are frequently stymied by the inability to gather accurate data about province-level activity, especially in the coal sector. China has faced past challenges in energy and emissions reporting since the mid-1990s (Sinton 2001). In 2015, the National Bureau of Statistics was accused of underreporting coal consumption by around 17% (Buckley 2015). In 2012, independent researchers found a massive discrepancy between national and provincial datasets on energy use in China. This discrepancy ultimately stemmed from small coal producers that only reported to provincial authorities, as well as systematic underreporting from provincial to national authorities (Guan et al. 2012), reflecting conflicting objectives between national and local actors. In light of this discrepancy, the national government recently updated historical statistics (Zhang et al. 2019).

In addition to climate-motivated regulation of coal in China, Chinese policymakers are also extremely motivated by air pollution associated with coal combustion. Public awareness in China has increasingly recognized that air pollution like sulfur dioxide, nitrogen dioxide, and particulate matter (PM_{2.5}) associated with coal combustion can induce life-threatening diseases (Bronstein 2018). Research has shown that people in northern China have a significantly lower life expectancy due to air pollution from coal-burning for municipal heating (Chen et al. 2013). Increasing awareness of these issues catalyzed a surge in environmental protests in China over the last decade (Hoffman and Sullivan 2015). This was also enabled by widespread economic growth and a growing middle class following the Reform era, leading to a "Not In My Backyard" or "NIMBY" phenomenon (Olesen 2014) (Liu 2013). While the Chinese public generally supports government-led climate action, air pollution has dominated public concern about risks associated with climate change (Li 2018).

Growing public awareness has highlighted the government's objective of maintaining social stability, evidenced by significant policy responses to air pollution from coal combustion, especially in wealthier, heavily populated cities like Beijing. Within specific cities, there is ongoing debate about whether this air pollution is more attributable to transportation emissions or coal combustion. Since the latter has proved easier to regulate, many industrial activities have been shut down and, in some cases, relocated out of the large, wealthy cities. These activities included coal burning for municipal heating in the winter, coal-fired power plants, and manufacturers directly using coal for production. In fact, Beijing has entirely eliminated coal-fired power plants. The municipal government has also promoted switching from coal to natural gas for the manufacturing sector since 2013 and for rural heating since 2017, significantly reducing air pollution in the area. However, urban air pollution regulation has led to concern about environmental justice, as coal-fired power generation and industrial coal use have moved to poorer Western and interior provinces.

It is important to note the differences in local- and national-level policy responses. Local episodes of air pollution have driven national policy. Following an acute episode of severe air pollution in Beijing in 2013 that attracted significant attention, including from international media, the State Council has issued edicts that curb polluting industries (Wong and Karplus 2017). At the same time, air pollution-related protests have not been suppressed by the CCP because they primarily target the inefficiencies of local governments. Protests highlighted local governments' failure to enforce national environmental policy, thus supporting the central government's environmental protection reform agenda (Kroeber 2013). Since 2012, however, there has been an increase in civil society activity on environmental issues directed toward the national government (Standaert 2017). The middle class creatively shifted its subject of protest from local government to the federal government using media. For example, documentaries like Chinese journalist Chai Jing's "Under the Dome" analyzed the effects of air pollution on Chinese citizens and exposed the inefficiencies of national environmental policies, serving as an implicit rebuke to both local and federal government officials who failed to manage polluters. The viral popularity of "Under the Dome" within China led authorities to aggressively block the film on the Chinese internet (Standaert 2017). In addition to internet-based censorship and increased monitoring of conversations regarding the subject on social media websites like Weibo, street protests were also suppressed.

Discussion

This study adds to a prevailing thread in the literature on the political economy of China's coal sector that the outcomes of various policy targets for China's coal sector are defined by the interplay between local and national actors. The overarching objective of economic development has led to massive coal overcapacity as provincial governments retained the power to approve and develop coal-fired power generation, even as national actors have increasingly prioritized environmental protection and global climate cooperation. This trend is reflected in the difficulty in establishing accurate data regarding coal consumption at the provincial level, the difficulty in establishing a legal framework for regulation of local polluters, and other aspects of environmental governance in China.

Another major finding is the importance of recent consolidation of coal-related SOEs in driving many trends in the coal sector. Economic reform, an ongoing process in China, has increasingly shifted economic and political power in China's coal production toward SOEs and away from smaller companies. These SOEs have increasingly moved toward vertical integration across coal production, transport, and electricity generation, while also expanding into various clean energy technologies given pressure from national-level targets to decarbonize. These SOEs face challenges of domestic overcapacity in a number of sectors, which also motivates their technological diversification. At the same time, a partially reformed power sector, dominated by just a few SOEs,

Table 7.2 Key actors and objectives in China's coal sector

<i>Societal objectives</i>	<i>Societal actors</i>
Sustain economic growth	Private coal companies
Affordable and reliable energy	Expert organizations (e.g. CSA, NCSC)
Employment	Coal-consuming industries
Reduce air pollution	NGOs
Climate change mitigation	
<i>Political objectives</i>	<i>Political actors</i>
CCP political legitimacy	State Council
Promotion to higher levels of government	NDRC
Economic development	NEA
Economic reform and marketization	MEE
Address industrial overcapacity	Provincial and municipal DRCs
Increase global leadership and soft power	SASAC
	SOEs

continues to give preference to coal-fired power generation, which drives further overcapacity. We summarize the key actors and objectives discussed in this chapter in Table 7.2.

Overall, we surmise that despite high-level commitments to low-carbon energy and peaking coal consumption, China's coal industry will be slow to transform. International criticism is largely ignored as China increasingly positions itself as a climate leader. The economic effects of the COVID-19 pandemic have thus far demonstrated that Chinese policymakers are favoring the traditional model of economic development via rapid infrastructure build-out, evidenced by a spate of coal plant approvals representing 40 GW of capacity in the first half of 2020 alone (Myllyvirta 2020).

A clean energy transition in China will largely depend on the ability of the national government to successfully implement its 2060 carbon neutrality agenda through control of SOEs and local government. Through scenario modeling, Tsinghua's Institute for Climate Change and Sustainable Development found that coal would need to make up less than 10% of the energy mix by 2050 to achieve the global 2°C target and less than 5% to achieve net-zero emissions (He 2020). Market-based policies like the national ETS can play a role in this transition, if power sector reform is successfully managed. China is also well-poised to benefit from energy transition by supporting domestic renewable energy and clean technology developers, including both private firms and increasingly diverse energy SOEs. Given the increasing priority national government actors are placing on environmental protection, climate policy, and clean energy, it is critical to continue to explore how the political economy of Chinese coal actors, their objectives, and contextual factors will shape the ability of the national government to achieve its agenda.

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