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This brief investigates the problem of mismatched political incentives in China's clean energy transition. Despite central government commitments to reducing the proportion of coal-fired power in China's energy mix, the political economy incentives of subnational actors often work in the opposite direction, leading to contradictory signals and poor implementation.

PROVINCIAL PREFERENCES AND MISMATCHED POLITICAL INCENTIVES SLOW CHINA'S CLEAN ENERGY TRANSITION

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INTRODUCTION

Reducing coal-fired power and increasing the contribution of renewable sources to the power mix are keys to China's clean energy transition. The speed and trajectory of this energy transition have implications for global climate and sustainability. Continued permitting of coal-fired plants, combined with inefficient dispatch rules, impedes the reduction of coal-fired power and increases the rate of renewable energy curtailment. We conclude with policy recommendations for political and regulatory reforms to address these obstacles.

Coal-fired power generation in China is a cause of low-level atmospheric pollution and a key driver of global carbon emissions. As the world's largest carbon emitter, China's policies have major global impacts. China's central government has committed to reducing coal consumption and limiting the construction of new coal-fired plants. However, skewed incentives across different jurisdictional levels are slowing the reduction of coal-fired power plants.

Coal has long been an important source of energy in China, accounting for 64% of China's energy consumption in 2015,¹ as well as 83% of China's carbon emissions from fossil fuel combustion in 2014 (Olivier et al 2015).² Coal-fired power plants generate about three-quarters of China's power, and are responsible for around half of the country's carbon emissions from fossil-fuel combustion (Olivier et al 2015). Given the continued significance of coal to China's economy as well as the outsized role that it plays in driving China's carbon emissions, policies governing coal-fired power plants have been, and must be, a major component of China's drive to limit coal consumption and reduce carbon emissions. Many experts predict that



Separating coal from stones in Shanxi Province, China

¹ "Statistical Communique of the People's Republic of China on the 2015 National Economic and Social Development," National Bureau of Statistics of China, February 29, 2016, http://www.stats.gov.cn/english/PressRelease/201602/t20160229_1324019.html

² Although recent statistics from China suggest that coal consumption has decreased slightly in the past two years, there have been a number of upward data revisions and ongoing debates on their accuracy and implications for carbon emissions. See e.g. <https://www.chinadialogue.net/article/show/single/en/8780-China-s-coal-consumption-and-CO2-emissions-What-do-we-really-know-and> and <https://www.carbonbrief.org/analysis-decline-in-chinas-coal-consumption-accelerates>

China's coal consumption has peaked or will peak in the near future (Wang and Li 2017), although there has been a broad range of estimates on this trajectory, with consumption predicted to increase again in 2017.³ Key questions remain as to the speed of this substitution of coal in the energy mix, and this will be highly determined by political and regulatory factors.

China's leaders have made tackling environmental challenges an increasingly prominent issue on the national agenda in recent years. In a joint statement with the United States in 2014, China said that it would peak greenhouse gas emissions and work to increase the contribution of non-fossil fuels to 20% of total energy by 2030, two goals later included in China's contributions at the 2015 Paris agreement (C2ES 2015). Most recently, in his speech at the 19th Party Congress, President Xi Jinping declared that China was, "taking a driving seat in international cooperation to respond to climate change," while reiterating China's commitments to emissions reduction.⁴

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Reducing coal consumption and limiting the construction of new coal plants is both an important constituent step toward achieving these commitments, and a goal that has been explicitly stated by the Chinese government (C2ES 2015, Finamore 2016). To reduce carbon emissions, the 12th Five Year Plan (2011-2015) emphasized the use of clean coal technologies, natural gas, and renewable energy (Wang et al 2016). The most recent 13th FYP pledged to cap energy consumption at 5 billion tons of coal equivalent by 2020.⁵ In summer 2017, the NDRC and NEA specified cuts in coal-fired power generation capacity by 170 million kilowatts over the same time period of 2016-2020.⁶ At the same time, Chinese leaders must reconcile the preferences of diverse domestic actors. Local governments and commercial actors, both state-owned and private, pursue distinct economic interests, often conflicting with central policies. This central-local dynamic complicates China's reduction in coal-fired power and slows China's energy transition.

DECENTRALIZATION AND PROVINCIAL OVER-PERMITTING

In March 2015, Beijing decentralized EIA approvals of coal power plants from the central-level Ministry of Environmental Protection to provincial-level Environmental Protection Bureaus (EPBs). The decentralization of EIA approvals was part of a broader national effort, led by China's State Council, to "streamline government and delegate authority" across a range of issue areas. The aim was to sustain healthy economic growth, by increasing the market's role in efficient allocation of resources and encouraging firm-level innovation and investment, while decreasing direct government involvement.

Our analysis shows that when provincial governments gain authority to permit coal-fired power plants, they have incentives to over-permit, hence contributing to over-capacity problems in China (Alkon and Wong 2017). There is a clear,

³ Yao Zhe and Wu Yixiu, "Is coal making a comeback in China?" China Dialogue, July 19, 2017.

⁴ "Full text of Xi Jinping's report at 19th CPC National Congress," Xinhua, October 18, 2017, http://www.chinadaily.com.cn/china/19thcpcnationalcongress/2017-11/04/content_34115212.htm.

⁵ "13th Five-Year Plan: What to Expect from China," United Nations Development Program Issue Brief, <http://www.cn.undp.org/content/china/en/home/library/south-south-cooperation/13th-five-year-plan--what-to-expect-from-china.html>

⁶ "China to Tackle Coal-Fired Power Glut," Caixin, August 14, 2017.

substantial spike in both the number of approvals and the added capacity after EIA approval was decentralized to the provincial governments in March 2015.

In the 38 months from January 2012 to February 2015, 143 plants received MEP approval, which is an average rate of 3.76 plants per month. However, during the subsequent 14 months spanning March 2015 through April 2016 inclusive, a total of 159 plants were approved by provincial EPBs, giving an average rate of 11.36 plants per month. This represents a threefold increase in the monthly coal plant approval rate. The total capacity approved prior to decentralization was 166,604 MW, giving a rate of 4384 MW per month. In contrast, nearly 121,000 MW of new generating capacity was approved during the period after decentralization, at an average rate of 8635 MW per month. This amounts to a doubling in the amount of new capacity approved per month.

Additionally, analysis of the length of time it takes to move through the approval process points to procedural changes after decentralization. We calculate the length of time between EIA pre-approval and EIA approval using reports on the pre-approval dates from MEP and provincial websites. Before decentralization, the mean length of time is 25 days before approval. This shortens to 18 days after decentralization. This one-week difference in mean approval time provides suggestive evidence in support of a politically motivated change in approval procedures.

THE PUSH FOR COAL-FIRED POWER: PROVINCIAL PRIORITIES AND POLITICAL INCENTIVES

In response to this surge in the permitting of coal-fired power plants, the central government has attempted to intervene by canceling or limiting new construction. In April 2016, Beijing released new guidelines,⁷ naming 13 provinces that should delay approvals of provincial coal plants,⁸ and 15 provinces that should delay the construction of coal plants that had not begun work by 2017.⁹ In addition, the central government established an annual “risk warning mechanism,” in which many provinces were given the “red light” and ordered to suspend approval of new coal projects. In addition, in January 2017 the National Environmental Administration issued a directive to 13 provinces,¹⁰ canceling over a hundred coal-fired plants that were planned or under construction, which amounted to 120 gigawatts of future capacity.¹¹

Although the central government has announced new policy guidelines, including bans, on the construction of new coal-fired power plants, evidence collected by NGOs such as Coalswarm suggests that new plants are still being constructed. In addition, provincial officials can still approve projects providing for “people’s livelihoods” (most likely for local heating needs) and national-level projects (e.g. exporting power to other provinces), which are exempt from these guidelines (Author’s interviews). This highlights the persistence of the policy implementation gap between Beijing and subnational political actors.

Why do provincial governments have an interest in rapidly approving and constructing more coal-fired power plants? This can be attributed to a number of factors. First, China’s system of political incentives pushes provincial governments to prioritize GDP growth and revenue extraction. While the Chinese government has started to include environmental targets as part of the cadre evaluation system, plausibly providing competing incentives, widespread implementation problems have limited the effectiveness of these environmental targets (Wang 2013). GDP growth performance is traditionally given far more weight in career promotion evaluations (Ran 2013), and political signals prioritizing economic growth and revenue extraction continue to dominate (Authors’ interviews). Although Beijing announced in 2017 that it would start

⁷ “淘汰煤电落后产能，建立煤电建设风险预警机制,” China Energy News, April 22, 2016.

⁸ The 13 provinces are: Heilongjiang, Shandong, Shanxi, Inner Mongolia, Jiangsu, Anhui, Fujian, Hubei, Henan, Ningxia, Gansu, Guangdong, and Yunnan.

⁹ The 15 provinces are: Heilongjiang, Liaoning, Shandong, Shanxi, Inner Mongolia, Shaanxi, Ningxia, Gansu, Hubei, Henan, Jiangsu, Guangdong, Guangxi, Guizhou, and Yunnan.

¹⁰ These provinces are: Gansu, Inner Mongolia, Guangxi, Guangdong, Henan, Ningxia, Qinghai, Shandong, Shanxi, Shaanxi, Xinjiang, Liaoning, and Sichuan.

¹¹ Michael Forsythe, “China Cancels 103 Coal Plants, Mindful of Smog and Wasted Capacity,” *New York Times*, January 18, 2017; “能源局下发13省市新建火电机组停建清淡（附文件）,” January 16, 2017, <http://news.bjx.com.cn/html/20170116/803648-4.shtml>

giving more weight to environmental indicators than GDP in officials' performance evaluations,¹² the implementation process remains unclear. Moreover, regular rotations of local cadres shorten time horizons at the expense of environmental policy implementation (Eaton and Kostka 2014). Thus, provincial officials by and large have not faced sufficient political or financial incentives to prioritize environmental issues.

Given the emphasis on economic performance, coal-fired power plants are seen as a quick way to stimulate the local economy, create jobs, and contribute more quickly to local tax revenue. Reflecting China's model of economic growth driven by investment spending, local governments and state-owned enterprises have easy access to credit financing in the form of near-zero interest loans from state-owned banks. A national economic stimulus package in 2009, in the wake of the global financial crisis, promoted heavy investment spending and spurred local governments to seek large infrastructure and energy-intensive projects (Qi and Wu 2013). In addition, existing central government tax exemptions for renewable energy means that traditional coal-fired power plants generate more revenue for local governments compared to wind and solar farms.

Relatedly, this system of political incentives creates suboptimal inter-jurisdictional coordination over power generation. Provincial governments seek to achieve energy self-sufficiency so as to avoid the loss of productivity (statistically) and fiscal revenue that results from importing energy from other provinces. Siting energy generation within the province ensures that tax revenue and economic activity remain on provincial ledgers; new construction further attracts investment and generates employment (Authors' interviews). This results in national over-capacity and market inefficiencies that could otherwise be eliminated by transmitting or trading energy across provincial boundaries.

In addition, the limited political power and monitoring capacity of agencies such as the Ministry of Environmental Protection and the National Energy Agency provide insufficient checks on pro-coal actors. EPB bureaucrats usually have little environmental policy experience and fewer opportunities for promotion. In fact, they often avoid enforcing regulations on polluting industries as doing so would risk employment termination and negatively affect career advancement (Ran 2013). All of this means that provincial governments and state-owned enterprises, and the coalitions they form, have far more incentive to approve new coal-fired power plants than does an increasingly environmentally-aware and climate change-conscious Beijing. This has led to an increasing mismatch in policy goals between local officials and the central government over issues such as air pollution and perceptions of climate change as a threat (Alkon and Wang 2018).

Furthermore, the electricity pricing structure of the power sector is designed to ensure generating firms' profitability and does not punish commercial over-investment. Similar generators are allocated an equal number of run hours (utility contracts also sometimes have a guaranteed allotment of hours sold to the grid) and standardized prices set by the NRDC (Myllyvirta et al 2016, Wang et al 2016). Building more plants and increasing generating capacity is thus seen as a way of increasing overall revenue, since individual operators do not foot the economic costs of overcapacity. Under the existing quota dispatch system, coal-fired power continues to be prioritized over renewables. In addition, coal-linked firms also have a history of closer political connections with grid companies and local governments. Together, these factors incentivize the continued construction of coal-fired power plants, and protect key interest groups, such as SOEs involved in coal-fired power generation and coal mining. Moreover, over-capacity (as opposed to electricity shortages) still constitutes a relatively recent phenomenon for the power sector, and political leaders tend to err on the side of conservatism, prioritizing the reliability of electricity supply.

There has also been a strong link between coal-fired energy capacity and curtailment rates of renewable energy in China's power markets. Despite the rapid rise of renewable energy in China, installed renewable capacity fails to reach the grid, or is curtailed. Curtailment rates in China, especially for wind energy, are among the highest in the world (Sui et al, n.d.). While intermittency and geographical mismatch in supply and demand are frequently identified as causes of curtailment, our research points to the importance of interests tied to coal-fired power plants in securing preferential access to the grid.

¹² Li Yan, "Environmental indicators given more weight than GDP in official performance assessments," People's Daily Online, February 22, 2017.



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Curtailment is also exacerbated by provincial leaders' preferences for indigenous generation, leading high-demand, renewables-poor states to rely excessively on coal rather than 'import' lower-variable cost renewable energy from renewables-rich provinces in China's North and North West.

The over-permitting of coal-fired plants creates vested interests and infrastructure that raises the costs – economic and political – of future generation curtailment, project cancellations, and emissions mitigation. While long-term trends suggest a reduction in coal use and an increased contribution of renewables to China's power supply, policy implementation and structural reforms of the power market will determine the speed of this transition. This will have important effects on air pollution in China as well as on the trajectory of global carbon emissions.

POLICY RECOMMENDATIONS

- *Grid dispatch should be reformed with goals of increasing overall efficiency and decreasing curtailment rates: this includes (a) insulating regional dispatch decisions from influence by local politicians, and (b) moving toward a dispatch system based on marginal cost.*
- *The cadre evaluation system should weight targets related to energy efficiency and environmental conservation more heavily than, or at least on par with, traditional metrics of economic performance. Provincial officials should be rewarded for importing energy from other provinces, rather than being incentivized simply to achieve certain levels of economic growth and revenue extraction.*
- *Early and coordinated action by the NDRC, NEA, and MEP to implement a rational power market planning policy will limit the logic of sunk costs and weaken vested interests that champion the continued construction and operation of coal-fired power plants. Agencies tasked with reform need to be given sufficient resources and political power to oppose powerful vested interests (including state-owned enterprises and provincial governments) whose preferences align poorly with Beijing's goals of energy efficiency and sustainability.*

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