GREENING FINANCIAL GOVERNANCE: LESSONS FROM CHINA

Peter Knaack

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ABSTRACT

China’s turn towards green financial governance has causes and consequences that are instructive for policymakers elsewhere. This paper traces the evolution of rules and regulations designed to guide China’s financial system towards supporting green firms and projects since the 1990s. It outlines four domestic reasons for China’s new and ambitious plan to reach carbon peak by 2030 and neutrality no later than 2060, and it identifies a shift towards climate-aware financial governance in recent years. The paper then looks at the current toolkit for the greening of finance, including green loans, bonds, the carbon emissions market, environmental liability insurance, prudential regulation and monetary policy measures. From a political economy perspective, the paper subsequently turns to the tension between center and provinces in governing finance and how the shift towards green financial governance may exacerbate existing inequalities between provinces. The final section distills policy lessons which may be useful for policymakers outside of China that are concerned with steering their financial systems towards supporting a green economy.

AUTHOR

Peter Knaack

Peter is an Associate at CEP as well as Adjunct Professor at the School of International Service, American University. He is also a Senior Research Associate at the Global Economic Governance Programme at the University of Oxford, and Research Associate at the Centre for Sustainable Finance at SOAS, University of London.

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1. ORIGINS: THE SLOW TURN TOWARDS GREEN FINANCE

Both the Chinese financial market and its governance have undergone massive transformation over the last four decades. Since the 1980s China’s financial sector has moved from a command system (Goodstadt, 2012a) to one where both state-owned and private financial firms compete in an ever-developing marketplace, supervised by an array of modern regulatory agencies. Even though the central bank and the agencies that supervise the insurance, banking and security markets are younger than most readers of this paper, these organizations have experienced several waves of restructuring, capacity building, and updates in their mandate, learning from best practices in Hong Kong and internationally as well as from the domestic and foreign financial crises that have shaken the Chinese market over the years.

China's financial system has faced several stability challenges in recent history. From the inflationary flare-ups in the 1990s (Bell & Feng, 2013) to the fallout from the Asian Financial Crisis and subsequent restructuring of the market and its governance (Yi, 2009; Hsiao et al., 2015; Borst & Lardy, 2015), Chinese policymakers had to take bold action to prevent the financial system from wreaking havoc on the real economy. Central authorities made successful and concerted efforts to reign in political lending and improve the balance sheet of commercial banks in the 2000s (Ba, 2010). But financial reform suffered a reversal with the outbreak of the Global Financial Crisis, when Beijing ordered a massive credit expansion in 2009 under its 4trn yuan stimulus package (X. Zhou, 2012; Lardy, 2012; Borst, 2013). And even though China's regulatory agencies had modernized and upgraded their supervision in line with global best practices after joining the Financial Stability Board and the standard setting bodies it coordinates in 2009 (Knaack, 2017), the emergence of shadow banking (L. Shen & Huang, 2016), excessive local government leverage (Goodstadt, 2012b), the boom and bust of private informal finance (Breslin, 2014) and other instances of regulatory arbitrage threatened financial stability throughout the 2010s. Most recently, the rise of digital finance has generated both a wealth of opportunities for financial inclusion and headaches for financial supervisors and competition authorities (PBC Research Office, 2015; Y. Shen & Huang, 2016; Y. Liu & Ren, 2020).

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<th>TIMELINE</th>
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<td><strong>GREEN FINANCIAL GOVERNANCE IN CHINA (SELECTION)</strong></td>
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<tr>
<td><strong>1995:</strong> China's regulation of green finance starts with the Notice on Relevant Matters of Implementing Credit Policies and Enhancing Environmental Protection by the People's Bank of China (PBC)</td>
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<td><strong>2007:</strong> Opinions on Implementing Environmental Protection Policies and Regulations to Prevent Credit Risks, along with the Green Credit Policy issued by PBC, China Banking Regulatory Commission (CBRC), and State Environmental Protection Administration (SEPA)</td>
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<td><strong>2007:</strong> Guiding Opinions on Environmental Pollution Liability Insurance issued by SEPA and the China Insurance Regulatory Commission (CIRC), followed by pilot project guidelines in 2013</td>
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<td><strong>2008:</strong> Notice on Documents to be Submitted When Production and Operating Companies in Heavily Polluting Industries Apply for IPO issued by the China Securities Regulatory Commission (CSRC)</td>
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Financial governance in the Chinese party-state differs from that of other countries. In contrast to other jurisdictions, an analytical separation between state and party would be misleading when trying to understand financial governance in China. The Communist Party of China has shaped the construction of capitalism with Chinese characteristics, and it has incorporated financial development into a greater plan to serve the real economy, bring about sustainable prosperity, create a moderately wealthy society (小康社会) in the short term, and contribute to the rejuvenation of the Chinese nation in the long run (Gruin, 2019). The party-state derives performance legitimacy from its ability to steer a complicated structural transformation process of the financial system and the economy at large under the umbrellas of “reform and opening” and, more recently, “common prosperity” while always maintaining social stability and Party control over society (Gruin & Knaack, 2019).

Environmental sustainability however was not of relevance in financial governance until the 2000s. As early as the 1980s, Beijing included sustainability concerns in its stewardship of the financial system. But pollution of air, water, and soil along with biodiversity loss and other environmental externalities are mispriced in the financial market and were not severely punished by state authorities. The first moves to incorporate environmental concerns into financial governance take the form of soft policies in the late 2000s (see timeline). Dikau & Volz (2021) find evidence of window guidance by the People's Bank of China (PBC) and the former China Banking Regulatory Commission (CBRC) to discourage lending to carbon-intensive and polluting industries and increase support for green activities from 2006 onward. But it was not until 2012/13 that the CBRC established Green Credit Guidelines and a Green Credit Statistics System to distinguish loans that support environmental sustainability (Tian et al., 2015).

The 2010s represent a step change in environmental awareness both among the public and the government. Unlike greenhouse gases (GHG), which have consequences on a global scale, pollution of air and waterways can be understood as less of a cross-border externality because their cost is felt by the local population in more immediate ways.


2012: CBRC issues Green Credit Guidelines

2013: CBRC publishes the Green Credit Statistics System, classifying 12 types of green loans

2015: PBC issues the Green Bond Endorsed Project Catalogue

2015: Establishment of the Green Finance Committee at the PBC: incorporation of climate-related and environmental risks on the prudential, individual bank- and loan-based level, plus environmental stress testing for banking sector

2016: Guidelines for Establishing the Green Financial System issued by the PBC, CBRC and five other governmental agencies

2016: G20 under Chinese Presidency establishes the Green Finance Study Group, co-chaired by the PBC and the Bank of England

2017: PBC is one of 8 founding members of the Network for Greening the Financial System (NGFS)

2018: PBC changes its medium-term lending facility framework, expanding collateral to include green bonds

2020: President Xi Jinping pledges carbon peak by 2030 and neutrality by 2060

TIMELINE (CONTINUED)
Thus, rather than GHG emissions, it was contaminated seafood from dirty lakes and rivers, and the rise of respiratory diseases in cities with severe air pollution that stirred public awareness of the costs of fast-paced industrial development in China (Cheng et al., 2021). In 2014, Premier Li Keqiang (李克强) made a commitment to “resolutely declare war on pollution as we declared war against poverty”. A documentary film and speaker’s tour in 2015 tipped the balance towards mainstream expressions of environmental concerns. Chai Jing (柴静), a well-respected investigative reporter for CCTV spoke out on air pollution. Her documentary Under the Dome (穹顶之下) was watched more than 150 million times in a week, before the authorities blocked it on Chinese websites (OnEarth, 2015).

2. THE SHIFT TO CLIMATE-AWARE FINANCIAL GOVERNANCE: POLICY MOMENTUM AND MOTIVATIONS

The shift from pollution to climate change as the salient environmental concern for financial governance has only started in recent years. As early as 2007, the 17th National Party Congress coined the term ecological civilization (生态文明) as a national goal. China emerged as a champion for green finance at the G20 in 2016 and as a founding member of the Network for Greening the Financial System (NGFS) in 2017. But these actions did not imply a comprehensive and effective shift towards green financial governance. Chinese representatives in global climate forums highlighted the principle of “common but differentiated responsibilities” of the United Nations Convention on Climate Change, arguing that developing countries should not take on too many obligations, and that financial and technical support for emissions reduction should come from developed countries (Nordhaus & Wang, 2021; X. Zhou, 2021).

President Xi Jinping (习近平) signaled a major shift when he declared China’s new climate goals in September 2020. As early as 2014, China had announced its intention to cap GHG emissions by 2030. But at the 75th Session of the UN General Assembly, President Xi pledged that China will reach peak emissions before 2030 and achieve carbon neutrality by 2060. To achieve this ambitious “30-60” goal, the Chinese economy will have to undergo a massive transformation in terms of its energy mix, production and structure. Investment needs across key green sectors in China were estimated at 2.9tr yuan ($460bn) per year before 2020 (Zhang et al., 2015), and meeting the 30-60 goal requires an even higher level of investment over the coming decades. Experts estimate the total of China’s green investment needs until 2060 to range between 100 and 300tr yuan (ca. $16-47tr) (W. Peng, 2021; C. Zhou, 2021; X. Zhou, 2021). This translates to an average annual investment of 2.5 to 7.5tr yuan (2.4-7.3% of 2021 GDP) (G. Liu, 2021). While significant, this amount pales in comparison to the cost of non-action: A recent study by the Swiss Re Institute highlights that in a baseline scenario of a 2-2.6 degree increase in average global temperatures, China may face losses of 15-18% of its GDP by 2050. Under a severe scenario of a 3.2 degree temperature increase, China’s loss in GDP is estimated as high as 24% (Swiss Re Institute, 2021) (X. Wang, 2021b).

The Chinese party-state is making major efforts to translate the 30-60 goal into policy directives and action. On the Party side, the move towards a carbon-neutral economy is
part and parcel of three major guidelines in Party thinking about the future that represent the spirit of the Fifth Plenary session of the 19th Central Committee in November 2020. General Secretary Xi declared that China has entered a new development stage (until the centenary of the People’s Republic in 2049), a new development philosophy (innovative, coordinated, green, open, and shared), and a new development paradigm (of the economy centered around dual circulation, domestic first but also international). The Central Committee for Financial and Economic Affairs, a sub-group of the Central Committee, reinforced this change in direction at its 9th meeting in March 2021. Chaired by General Secretary Xi, the Committee declared working towards the carbon peak and neutrality as one of its eight major tasks in 2021. The 30-60 pledge was elevated to a goal post in a wider process of securing the sustainable development of the Chinese nation – a level of importance that few other policy initiatives reach. In other words, changing the domestic rules of finance to meet China’s climate goals is not merely a technical or regulatory initiative, it has become a top-level political project that Beijing can be expected to unwaveringly pursue over the coming decades.

Figure 1: Organs of Relevance for Greening Financial Governance in China’s Party-State (Selection)

State authorities are also implementing Xi’s pledge for a turn towards low-carbon development. In February 2021, the State Council issued “Guiding Opinions on Accelerating the Establishment and Improvement of a Green and Low-Carbon Circular Development Economic System”, making reference to the dual circulation development paradigm mentioned above (PRC State Council, 2021b, 2021a). The 14th 5-year plan (2021-25), released by the National People’s Congress (NPC) one month later, prioritizes ecological sustainability and envisions a turn of the financial system towards green and low-carbon finance (X. Wang, 2021a). In a cross-agency joint publication not common outside of China, the National Development and Reform Commission (NDRC) and four other departments jointly released the Notice on Guiding and Increasing Financial Support to Promote the Healthy and Orderly Development of Wind and PV Power Generation Industries (NDRC, 2021). Addressing “all
provinces, finance departments (bureaus), PBC Shanghai headquarters, branches, business management departments, central sub-branches of provincial capitals, central sub-provincial city sub-branches, and banking and insurance bureaus”, it calls for financial institutions to provide more credit support to renewable energy enterprises. This includes not only new loans at subsidized rates, but also a certain degree of leniency when renewing or rolling over loans. This is not a return to the policy lending spree of 2009, but it marks the first time central authorities order financial institutions to cast a favorable look at the creditworthiness of green companies. For its part, the PBC regards implementing the State Council policies on green and low-carbon circular economy as well as improving the green finance policy framework and incentive mechanism as one of its top ten tasks in 2021. PBC Governor Yi Gang (易纲) declared in March 2021 that green finance will be a priority for prudential regulation, monetary policy and the investment of foreign currency reserves (Q. Peng & Han, 2021). Thus, while green finance has existed as a niche policy and product for over a decade, the policy turn following President Xi’s pledge means that Beijing is likely to make environmental sustainability a key guiding principle of the domestic financial system as a whole.

While the exact constellation of drivers for this new policy momentum is unclear, several plausible explanations are worth mentioning. There are indications that Xi Jinping personally places greater importance on the environment than his predecessors (J. Liu, 2021), but this discussion note is in no position to analyze the political and economic considerations in the heads of China’s top policymakers, nor the complex deliberations in the government compound at Zhongnanhai. But several key tendencies in China’s development align with Beijing’s forceful shift towards a low-carbon economy and the greening of finance to support it. Four of them are outlined in simplified fashion below.

Figure 2: China’s Oil Consumption and Imports

![Figure 2: China’s Oil Consumption and Imports](source: US Energy Information Administration)
First, a shift to renewable energy increases China’s energy security and strategic independence. The country is at a disadvantage in fossil fuels due to limitations in its natural resource endowments. China’s oil production has stagnated while domestic oil demand has risen steadily. By 2018, the country imported over two thirds of the oil it consumed. And even though the country has sizeable coal endowments, China is a net importer, with 304 million tons of coal entering the country in 2020. The transition away from oil and other fossil fuels for power generation and transportation will allow China a greater degree of strategic independence at a time of heightened great power rivalry and geopolitical tension. Premier Li Keqiang confirmed at a meeting of the National Energy Committee in October 2021 that energy security is linked to development and national security, and that China should improve its self-reliance in energy supply (Li, 2021).

![Figure 3: China’s Primary Energy Consumption by Fuel Type, 2019](image)

Second, the shift to a green economy aligns with the current relative endowment of factors of production and China’s comparative advantage. As a middle-income country with a shrinking labor force and continuously rising living standards, China is losing its competitive edge in labor-intensive low-tech manufacturing. From a new structural economics perspective, industrial policy that promotes high-tech, knowledge-intensive manufacturing will allow the Chinese economy to continue expanding at a high rate in the medium term (J. Y. Lin, 2014; J. Y. Lin et al., 2013; Y. Lin, 2021). Renewable energy generation and storage, electric vehicles, and new materials are all part and parcel of a shift from manufacturing (制造) to intelligent manufacturing (智造) that is also associated with a move away from polluting heavy industry. In an internal speech to top-level party cadres in January 2021, General Secretary Xi argued that “the cost of labor is gradually rising, the capacity of
resources and environment has reached a bottleneck, the old formula for production functions has become unsustainable, and the importance of science and technology has risen” (Xi, 2021b, translation by author).

**Third, government intervention to promote green technology can address two externalities at once.** The 2018 Nobel Prize in Economics was awarded to two scholars working on market externalities of the bad (William Nordhaus on carbon emissions) and the good kind (Paul Romer on technological advances). Policymakers in Beijing might have taken notice. Government intervention is key in addressing both externalities, as public policies can promote research and development for green technologies that are critical for the transition to a low-carbon economy. The green technology sector is expected to entail strong economies of scale and spillover effects for the Chinese economy (W. Peng, 2021). Public policies to promote it also align with the new development paradigm mentioned above, stimulating high value-added manufacturing and services domestically (internal circulation) and helping China emerge as a global leader in green technology (external circulation) (W. Wang, 2021; Huang, 2021). By 2020, the country has already reached the technological frontier in some green technology sectors such as photovoltaics, wind power generation, and electric vehicles.

**Fourth, technological advances have improved the financial viability of green investment and production.** Back in 2015, scholars from the Development Research Council of the State Council argued that “many green investments remain unattractive to the private sector and are carried out by the public sector or with explicit or implicit subsidy” (Zhang et al., 2015, p. 8). In contrast, resource- and energy-intensive industries remained attractive to commercial banks, offering high returns to their investment. But the additional cost associated with climate-friendly production, or “green premium” as Bill Gates calls it, has decreased significantly over the last years. A recent study estimates that the green premium of renewable power generation in China is already down at around 17% (W. Peng, 2021). In other carbon-heavy industries such as aviation, construction materials, and chemicals, green technological progress may also bring about a decline in green premium margins of a similar magnitude over the coming decade, making investment in the green economy attractive for a wider range of financial intermediaries.

**Figure 4: Green Premium Estimates Across Selected Industries**

![Green Premium Estimates Across Selected Industries](Source: Peng (2021))
3. THE CURRENT STATE OF GREEN FINANCIAL GOVERNANCE IN CHINA

Government intervention is required to channel capital away from harmful and into green economic activities. China has been an early mover in green finance, devising a number of innovative methods to address environmental market externalities. This section provides a brief overview over the range of regulations, instruments, markets, and policies in China that are designed to guide the financial system towards supporting the transition to a green economy. It also provides a brief critical assessment of each green finance tool. Greater political economy concerns that apply to the entire toolkit at once will be presented in section four.

Left to its own devices, the financial market would not be supportive of China's green goals. Environmental externalities are not correctly priced, well-functioning markets for pollution and carbon emissions are only in nascent stages, and the green premium is still challenging the viability of investment in environmentally sustainable projects. Moreover, many commercial banks in China still view state-owned enterprises in heavy industries as low-risk borrowers, whereas the SME-dominated energy conservation and environmental protection sector is considered more risky due to their lack of collateral or credit guarantees (Tian et al., 2015). As a Chinese observer recently noted: “Finance ignores ecosystems, resulting in increasing environmental and social problems.” (N. Liu et al., 2020, p. 3).

China's overseas investment under the Belt and Road Initiative poses additional challenges. Until very recently, Chinese banks were a major source of financing for coal power plants along the Belt and Road, where fossil fuel tends to be in relatively abundant supply. The 30-60 target and policies to implement it are domestic and do not currently consider overseas investment (CCIEE & UNDP, 2021). There is talk about cross-border integration of carbon markets, but this crucially depends on the enthusiasm of governments along the Belt and Road, not only Beijing. Given this situation, many observers were surprised when President Xi stated at the UN General Assembly in September 2021 that China will halt all financing of new coal power projects abroad (Stanway & Brock, 2021). Renewable energy has occupied a growing share of Chinese investment under the Belt and Road Initiative in recent years, and Xi’s pledge can be expected to accelerate this tendency (C. N. Wang, 2021).

China's policymakers have devised a range of administrative and market-based measures to nudge the domestic financial market into a more sustainable direction. Administrative measures such as prohibition of certain activities or penalties for violations have been in place for decades. Prohibiting banks from providing credit support for projects that have failed environmental evaluation approvals are a case in point. Yet, as a general tendency, China's financial governance is moving away from administrative measures towards policies that harness the power of the market to achieve desired outcomes (Zhuo & Zhang, 2015). Greening finance in China has the potential to combine financial development, economic growth, and environmental improvement. It can lower the cost of funds for green industries and raise that of unsustainable ones in ways that could be instructive for policymakers around the world. The following paragraphs will provide a brief description of five main instruments of green finance, namely green loans, green bonds, environmental liability insurance, the carbon market, and prudential and monetary policy measures by the central bank.
Green loans

Green loans are China’s oldest green financial measures. In 2006, Industrial Bank (a smaller commercial bank not to be confused with behemoth ICBC) worked with the International Finance Corporation (IFC) to issue the first “green credit” product in China—a loan fund for energy conservation and emission reduction projects. In the following year, SEPA, PBC and CBRC jointly released the Opinions on Implementing Environmental Protection Policies and Rules and Preventing Credit Risks, asking banks to steer credit away from “restricted” and towards “encouraged industries” while making compliance with environmental laws a necessary condition for loan approval (J. Y. Liu et al., 2015). In 2012, the CBRC issued Green Credit Guidelines, asking banks to incorporate an environmental and social risk assessment in loan origination. What constitutes “green credit” was unclear until 2013, when the Green Credit Statistics System defined 12 categories of environmental economic sectors (Tian et al., 2015). Local PBC offices in some provinces also started grading commercial banks on their administration of green credit, criticizing some and commending others in the public circular. Until recently, green financial policy took such soft measures, encouraging banks to expand green lending rather than punishing holdouts for the failure to implement green credit policies (G. Wang, 2015). At an annual rate of close to 14%, green credit has grown faster than average loans. This means that green credit has also been growing as a share of overall credit, expanding from 8.8% in 2013 to 10.4% in 2019 (Choi et al., 2020). The green credit balance of 21 major domestic banks is reaching 15tr yuan by end-2021 (PBC, 2021b).

Figure 5: Green Credit Balance, Major Chinese Banks, mid-year, in trillion RMB

![Graph showing green credit balance from 2013 to 2021](source: PBC)

However, evidence on the effectiveness of the green credit policy is mixed. Commercial banks developed their own definition of green credit, and potential borrowers were able to shop among banks for the lowest de facto standards (Tian et al., 2015). Moreover, banks are often under pressure from local governments to issue loans to non-green projects, and
existing performance evaluation mechanisms incentivize loan officers to prioritize short-term profits (G. Wang, 2015; Y. Wang & Zhi, 2016). The large majority of green loan recipients are state-owned enterprises and local investment platform companies that benefit from fiscal support by the local government (Zhang et al., 2015). Early studies that show green credit improves the financial performance of commercial banks (Yu & Ren, 2016; Cui et al., 2018) could be interpreted as an indicator of “greenwashing” by bank management. More recent research shows that companies in green credit policy pilot programs curbed their pollution (J. Sun et al., 2019), and that green social responsibility is associated with lower financing cost among listed companies (Ji et al., 2020). Another study suggests that the interest rate gap between loans to green and dirty industries is small (N. Liu et al., 2020).

The quality of environmental disclosure by borrowing firms needs improvement. Panel data from 320 companies in heavy polluting industries during 2008-16 shows that for these companies there is no correlation between green financing and Corporate Environmental Information Disclosure Quality. The authors conclude that the disclosure system does not send valuable signals to the market and has failed to become a decision-making tool for bank-risk management (F. Wang et al., 2019). Moreover, companies that need an environmental impact assessment (EIA) can buy them from EIA companies, creating conflicts of interest that may exacerbate greenwashing (Huang & Wang, 2021).

Environmental risk assessment among banks is still in a nascent stage. Currently only three commercial banks incorporate climate risk into their in-house stress testing. The PBC instructed pilot banks to improve their environmental risk management system as early as 2017. Recently, the PBC issued new, more ambitious guidelines on the information it expects banks to collect on themselves and their borrowers. Published in July 2021, the new environmental disclosure guidelines require all financial institutions to explain their in-house environmental risk management process and green policies. This includes information on scenario analysis or stress testing methods to quantify the impact of environmental risks on the financial institution itself and its borrowers, and disclosure on how the environmental impact of investment and financing activities are measured and assessed (PBC, 2021a).

Incorporating climate change considerations into green finance poses additional challenges. At around 15tr yuan ($2.3tr), China’s outstanding green loan balance currently ranks first in the world in absolute terms. However, the head of the PBC Financial Research Institute Zhou Chengjun (周诚君) recently noted that about 70% to 80% of assets on bank balance sheets are carbon-intensive or have a high environmental impact (C. Zhou, 2021). Precise numbers are lacking because even though the Ministry of Ecology and Environment (MEE, 2019) has set standards for calculating the carbon emissions of companies in key industries, there are currently no official guidelines on how to attribute carbon emissions to the assets of financial institutions. Some financial institutions worry that fast-paced decarbonization may have negative effects for their financial health: management might be forced to remove profitable high-carbon assets and struggle to replace them with low-carbon assets of similar profitability. But financial analysts respond that commercial banks should not “stop eating for fear of choking” (因噎废食) – even strong decarbonization measures today would only lead to slow change in portfolio composition given the relatively long maturities of assets on banks’ balance sheets (P. Guo, 2021).

Some financial institutions have devised green marketing strategies. At least one commercial bank has launched a low-carbon theme credit card and set up an “emission reduction account” for retail customers. Similarly, financial technology giant Ant Financial has created “Ant Forest” to reward customers for “green behavior” by planting trees. While such initiatives have earned the company greater customer loyalty and acclaim at the United
Nations (UN Digital Financing Task Force, 2020), it is doubtful that they will move the needle in combating climate change (Wang C., 2019). Meanwhile Greenpeace criticized Ant’s parent company Alibaba and its data center operator GDS for being a laggard in issuing renewable energy or carbon neutrality commitments (Walsh & Murphy, 2021).

Green bonds

China has become a market leader in green bonds over the last half-decade. In 2015, the central bank released guidelines and a taxonomy to guide the establishment of China’s green bond market. Three agencies share regulatory responsibility: the NDRC regulates the corporate green bond market in line with PBC guidelines, while the CSRC supervises publicly listed companies. By 2020, China has become the second largest green bond market, with about 15% of global issuance that year (C. Zhou, 2021). Even though fewer green bonds were sold due to the global pandemic, China issued 289bn yuan ($44bn) in 2020. At the same time, green bonds still only represent less than 1% of China’s overall bond issuance (CBI, 2021b).

As China’s fixed income market develops further, more financial innovation can be expected. In March 2021, China Development Bank issued the first “carbon neutrality” bond that is open to investors from around the world through the Shanghai Bond Connect program. In the same month, State Grid International Leasing Company Ltd. issued China’s first asset-backed commercial paper for carbon neutrality.

Recent regulatory adjustments reduce greenwashing and bring China more in line with global standards. Even though Chinese regulators have worked with the Climate Bond Initiative (CBI), a global private standard-setter, from the beginning, domestic green bonds allowed for financing of less-than-green projects such as “clean coal” power generation. As recently as 2020, about half of Chinese “green” bonds did not meet CBI standards. In April 2021, the PBC, NDRC, and CSRC jointly issued an updated “Catalogue of Green Bond Supported Projects (2021 Edition)”, which provides clearer and more restrictive technical and environmental standards. It also incorporates the “Do No Significant Harm” principle, which brings it closer to the EU classification scheme and global principles (CBI, 2021a). In November 2021, the EU and China published a joint analysis that shows where the green taxonomies of both jurisdictions overlap and where they don’t (IPSF Taxonomy Working Group, 2021). Domestic regulators have not set unified standards for financing carbon-neutrality projects yet (Q. Peng & Guo, 2021). Moreover, Chinese regulators are aware of the need to heighten supervision and enforcement in the domestic bond market to ensure bond issuers actually meet quality standards (T. Sun, 2021).
Carbon emissions market

China's carbon emissions market started operations in June 2021. The nation-wide launch followed pilot projects in eight provinces and cities since 2013. Emissions trading is located in Shanghai, rights registration, custody, and transaction settlement in Wuhan, and futures trading in Guangzhou. China Certified Emissions Reduction securities are traded in Beijing and Shanghai. At present, the first batch encompassing 2,225 power enterprises has opened all its accounts on the market, with two-year quotas allocated to those participating in carbon emissions trading. This marks the first time the state has asked companies to shoulder responsibility for the control of greenhouse gas emissions. In May 2021, the Department of Climate Change of MEE authorized the China Building Materials Federation to work on the building materials industry's inclusion in the national carbon market. Financial intermediaries are not participating yet. There are currently no regulatory standards for carbon emissions attributed to the assets of financial institutions. This would be a necessary step to calculate the carbon emissions associated with particular assets on the banks' balance sheets (T. Sun & Zhu, 2021).

Environmental liability insurance

Environmental liability insurance has been in the pilot stage for almost 30 years. Local governments in more than 30 provinces (autonomous regions and municipalities) have launched pilot projects, and more than 2000 enterprises have purchased environmental liability insurance since the 1990s. SEPA and CIRC issued guiding opinions on this insurance product in 2007, and again in 2013, but they were not legally binding (Zhang et al., 2015). One fundamental implementation obstacle is a lack of data: environmental assets are not correctly priced, and in the absence of a proper appraisal and inspection system for environmental pollution damages, firms have insufficient incentives to either purchase...
liability insurance or increase their investment in controlling environmental risk (Tian et al., 2015). In 2018, the authorities issued Compulsory Environmental Pollution Liability Insurance (CEPLI) Regulation, requiring every company operating in a government-defined major environmental risk area to purchase liability insurance (MEE, 2018).

Prudential regulation and monetary policy

China’s central bank is developing a growing toolkit for greening finance. Building on years of policy experimentation, the PBC has issued a set of policies to guide the financial system towards greening investment. The toolkit spans both areas of prudential regulation and monetary policy, in line with the organization’s mandate. A paper by several staff members indicates that fighting climate change is seen as not just a Party directive but a serious professional concern: “We believe that climate risk may evolve into the world’s biggest systemic risk in the future” (X. Wang et al., 2020, p. 16). This section provides a brief overview over three tools in which the PBC has started reflecting climate and environmental considerations, namely its macroprudential assessment, its collateral policy, and a new targeted refinancing line.

The PBC has incorporated green criteria into its macroprudential assessment system (MPA). Launched in 2016, the MPA is the basic mechanism of the PBC’s double-pillar framework that combines monetary and macroprudential policy. It evaluates commercial banks on a quarterly basis and adjusts the interest rates banks earn on their reserve deposit at the central bank. Because reserve ratio requirements are considerable in China (between 12.5% for large and 6% for small rural banks in mid-2021) even small changes in the interest rate provide banks with an incentive to adhere to PBC guidelines (Zheng, 2018). Since late 2017, the PBC has incorporated green finance considerations into the MPA, incentivizing banks to increase their stock of green loans and bonds (Y. Wang, 2018). The MPA evaluation comprises seven dimensions, and it is unclear what relative importance green performance is given among them. The central bank published an update to its guidelines on how to evaluate the green performance of banks in 2020 (PBC, 2020). According to the current methodology, banks are evaluated on the basis of quantitative (80% weight) and qualitative (20%) indicators (see Table 1). Banks that score two standard deviations above the weighted average of the quantitative indicators get 100 out of 100 points for each indicator, average ones receive 60 points, and the worst performers receive 20 points. While this evaluation method arguably is more advanced than that of most other central banks, it might still be considered rudimentary. In the future, a carbon accounting system and greater data availability will allow supervisors to assess the carbon intensity of each loan and bond in a bank’s portfolio rather than relying on a binary distinction between green and everything else.
Table 1: The Green Performance Evaluation System of the PBC

<table>
<thead>
<tr>
<th>Quantitative</th>
<th>Scoring Basis</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of green assets in bank portfolio</td>
<td>Green loans as a share of overall loans, green bonds as a share of total bond holdings</td>
<td>25%</td>
</tr>
<tr>
<td>Market share</td>
<td>Green assets of a bank as a share of green assets of all participating banks</td>
<td>25%</td>
</tr>
<tr>
<td>Annual growth rate of green assets</td>
<td>Year-on-year growth rate of green assets of the bank</td>
<td>25%</td>
</tr>
<tr>
<td>Green asset risk</td>
<td>Non-performing loan ratio of green loans, share of non-performing green bonds</td>
<td>25%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Qualitative (Evaluation by supervisory authorities)</th>
<th>Scoring Basis</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation of national and local green finance policies</td>
<td>Comprehensive consideration of the implementation of green finance policies by banks</td>
<td>30%</td>
</tr>
<tr>
<td>Implementation of the institution's own green finance development strategy</td>
<td>Refer to the self-evaluation of the implementation of green credit policies of financial institutions, and comprehensively consider the green finance development strategy, development planning, risk control, loan approval, performance appraisal</td>
<td>40%</td>
</tr>
<tr>
<td>Financial support for the development of green industries</td>
<td>Comprehensive consideration of the scale of funds, interest rates, investment directions, approval procedures, due diligence, loan plans, post-loan management, ledger management, etc., of bank deposit financial institutions supporting green industries and project development</td>
<td>30%</td>
</tr>
</tbody>
</table>

Source: PBC (2020)

Green bonds and loans are included in the pool of eligible collateral for central bank lending. In June 2018, the PBC decided to accept green loans as part of the standing lending facility and AA-rated green bonds as collateral in its medium-term loan facility. Moreover, it treats green assets as preferable over non-green assets with equivalent characteristics. This decision increased the spread between non-green and green bond yields significantly (Macaire & Naef, 2021).

A new targeted refinancing line supports green loans. Since November 2021, banks can turn to the central bank to refinance new green loans at a lower interest rate. The Carbon Emission Reduction Facility (CERF) of the PBC re-finances 60% of qualifying loans at a rate of 1.75%, compared with the widely accessed medium-term lending facility (MLF) at 2.95% (PBC, 2021c). This move makes the PBC the second G20 central bank in the world to use targeted refinancing operations for green purposes, after the Bank of Japan. While some observers had expected more significant monetary support, the new tool is designed to be “small and refined”, at least in the initial stage (Wang Y., 2021).
measures, and credible verification of green projects are three necessary conditions to make this policy effective (S. Guo, 2021). In order to improve data availability and assessment quality, the PBC is also exploring the establishment of a national carbon accounting system (Q. Peng & Han, 2021).

4. THE POLITICAL ECONOMY OF GREENING FINANCE IN CHINA: CENTER VS PROVINCES

The implementation of China's policy shift towards greening finance highlights the relevance of domestic political economy considerations. The following paragraphs will briefly trace the outlines of a key dynamic within China's political economy that may also contain valuable lessons for policymakers around the world. It focuses on tension between center and provinces in how to govern finance, an age-old phenomenon that may also impact the implementation of new climate-aware financial policies.

Local governments have long enjoyed some degree of financial autonomy from Beijing. Mao Zedong espoused local autonomy in financial matters as a safeguard against what he regarded as excesses of Soviet planning. After 1976, attempts by the Ministry of Finance and other central agencies to regain a greater degree of control were met with resistance by local officials. Even though the Asian Financial Crisis of 1997 triggered drastic reform in China's financial governance, it did not diminish the power of local officials over financial institutions significantly (Goodstadt, 2012a). Local policy lending and relationship-based lending, whereby local government officials nudge banks to lend to their preferred investment projects without much commercial or prudential scrutiny, were highlighted as two key problems of China's financial governance in 2007 by Zhou Xiaochuan (周小川), then central bank Governor (Goodstadt, 2012b). Around that time, about 80% of non-performing loans were associated with local government projects (He, 2013).

Environmental sustainability has not played a large enough role in the performance evaluation of local governments until recently. Both debt and environmental sustainability challenges faced by local governments can be linked to China's method of measuring performance in the party-state. Local government leaders compete among each other for promotion in a rank-ordered tournament. Short-term and localized indicators such as economic growth in a given province were more salient in this performance evaluation than longer-term and more dispersed ones such as leverage and environmental pollution (Carney, 2012). This had consequences for green finance, too. For example, environmental protection authorities at the local level were significantly more willing to provide firms with the environmental protection verification that is a prerequisite for loans or IPOs in some sectors than their counterparts at the national level (Tian et al., 2015). Since the 3rd Plenum of the 18th Party Congress in November 2013, local officials are subject to lifelong responsibility for environmental damages and an audit on natural resources when leaving office (G. Wang, 2015). Such changes have helped narrow the incentive gap between the local and central government regarding the environment in general and greening finance in particular.
Local government officials still face difficult trade-offs between environmental and economic performance today. Power supply problems in the second half of 2021 are a case in point. On the one hand, domestic firms have increased production as exports have surged by 23% year-on-year, leading to a rise in power demand of 13.8%. On the other hand, central authorities are using administrative measures to reign in GHG emissions. An August notice by the NDRC showed that about two-thirds of provincial-level regions missed their emission-reduction targets in the first half of 2021 (X. Chen et al., 2021). This warning triggered local governments to institute coal mining and power supply caps. Given the stern consequences of sub-par performance in either environmental or economic terms, local officials have a strong incentive to turn a blind eye to greenwashing. A string of fraud cases in China’s environmental testing and monitoring system points to conflicts of interest that will require the attention of policymakers now and in the future (Cai, 2021; Z. Chen, 2019).

Carbon reduction policies may exacerbate existing inequalities. The impact of green economic transformation will differ significantly among regions. For example, coal mining is a significant source of jobs and income in some Western and Northern provinces, and heavy industry is a key pillar of the economy in the Northeast. At the same time, these provinces lag behind the coastal and southern regions in terms of financial sector depth and sophistication, technological development, and per capita income (Tian et al., 2015). Moreover, governments in more prosperous Eastern and Southern Provinces have subsidized green finance. For example, the Jiangsu local government introduced an incentive scheme in 2018, covering 30% of the coupon of green bonds issued in the province (Cheng et al., 2021). The local government of Huzhou in Zhejiang Province went further, establishing a “green finance system” that incorporates a database on green projects and a one-stop e-green finance platform where qualifying businesses can apply for green loans at preferential rates (CCIEE & UNDP, 2021). In other words, the economic costs and opportunities afforded by China’s low-carbon transformation are not evenly distributed.

Emerging empirical studies show a spatial clustering of green finance, economic development, and environmental quality. Zhou Xiaoguang and colleagues construct a green finance development index and an environmental quality index for China’s provinces in a recent paper. The researchers find a correlation between green finance, economic development, and environmental quality (X. Zhou et al., 2020). A paper by Liu and colleagues (2020) provides a possible explanation for this puzzle. Using provincial-level data from 2007-16, the authors find that the Eastern coastal region boasted both the highest level of green finance and green economic development. In contrast, Western regions lag behind on both counts, whereas the central and northeastern provinces exhibit what the authors call “unbalanced” development (N. Liu et al., 2020). Relatively backward provinces may struggle to catch up, even when they count on favorable resource endowments, such as renewable energy sources. Thus, in the absence of targeted corrective policies, the current system of green financial governance might allow inter-provincial inequalities to deepen further.
Addressing geographic inequalities will be a challenge for policymakers in Beijing. The top leadership is engaged and enthusiastic about a shift to a low-carbon transition in finance and the economy at large, but lower levels of government have yet to catch up. This might be an instance of the “hot above, cold below” (上热下冷) phenomenon that has characterized China’s policymaking environment in other areas. Some policymakers suggest to establish a national reward and punishment mechanism for carbon finance, including green and low-carbon indicators in local economic development evaluations (W. Wang, 2021). Others focus on capacity building, green finance pilot projects (the recently issued Shenzhen Special Economic Zone Green Finance Regulations are but an example), and peer learning among government officials at an inter-provincial level (C. Zhou, 2021).
LESSONS FROM CHINA

While many elements of China’s transition towards green financial governance are country-specific, several may be instructive for policymakers in other jurisdictions. This section identifies three sets of policy insights that may inspire experts outside of China. The first lesson concerns the importance of inter-agency cooperation and coordination in issuing and implementing sustainable finance policies. Second, Beijing is striking a balance between administrative and market-based measures that might be informative for financial policymakers. And third, China’s concern with reducing inequalities in financing the shift to a low-carbon economy may inform efforts by politicians that care about a “just transition” elsewhere.

China seeks to break down silos between financial and environmental authorities. Joint issuance of green finance policies and coordination in their implementation is not an easy task. As early as 2007 financial regulatory authorities began to strengthen cooperation with their environmental protection colleagues in government. But while central authorities established an information sharing mechanism between the two sides, policymakers at the provincial level were hesitant to use it. Scholars from the State Council DRC noted in 2015 that even in Beijing, “interdepartmental shuffling of and argument over the responsibilities or fighting for power or protection over key issues are not surprising” (Tian et al., 2015, p. 109). Since then, and learning from instances of regulatory arbitrage, the Ministry of Ecology and Environment, NDRC, PBC and financial regulators have established wider channels of cooperation, and most policies and regulators of relevance today are jointly issued by these authorities. In May 2021, Vice Premier Han Zheng (韩正) assembled high-ranking officials from financial, environmental and other authorities to form China’s peak carbon and carbon neutrality leading small group (碳达峰碳中和工作领导小组) as the highest coordination mechanism to lead China’s emissions reduction work, including but extending beyond finance (Xinhua, 2021).

The shift to green finance in China is driven by a combination of administrative and market-based instruments. Because environmental externalities are notoriously hard to price, administrative measures such as permits and prohibitions have dominated policymaking for a long time. But today Beijing is shifting towards more market-based instruments to make the financial system environmentally sustainable. Policy initiatives include the push for commercial banks to include environmental factors in their stress testing, adjusting central bank interest rates to green bank credentials, and the establishment of a national carbon accounting system in the near future.

Policymakers are under no illusion that the financial market by itself will remedy inequalities and bring about a just transition to a low-carbon economy. Communist Party philosophy has changed over the years in step with China’s development. Whereas Deng Xiaoping advocated for “those who get rich first to help others get rich later” (先富带后富), Xi Jinping’s new development philosophy encompasses common prosperity (共同富裕) as a key concept (Xi, 2021a). In a meeting with high-level cadres in January 2021 the General Secretary asserted that “achieving common prosperity is not only an economic issue, but also a major political issue related to the Party’s governing foundation.” (Xi, 2021b, translation by author). Policymakers thus concentrate their efforts on adjusting financial governance in a way that seeks to reduce inequalities among provinces, between SMEs and large state-owned companies, and between wealthy and low-income households. Not every
country is governed by a one-party state that relies on performance legitimacy. But given alarming inequality levels worldwide, policymakers elsewhere may also want to pay more than lip service to concerns about a just transition.
REFERENCES


Wang, X. (2021a). The reform direction of the financial industry during the 14th Five-Year Plan “十四五”金融业改革方向. China Finance 40. http://mp.weixin.qq.com/s?__biz=MjM5NjgyNDk4NA==&mid=2686020366&idx=1&sn=4f349c6116c1633314b0be590c333f9e&chksm=830e99f9b47910efbad14c2fac178dd89a91ad7981774f2ac30978b0e04eb12d0edccef24b#rd


Xi, J. (2021a). During the 27th collective study session of the Politbureau, Xi Jinping emphasized the complete, accurate and comprehensive implementation of the new development philosophy to ensure that China’s development during the “14th Five-Year Plan” period has a good start. (习近平在中共中央政治局第二十七次集体学习时强调 完整准确全面贯彻新发展理念 确保“十四五”时期我国发展开好局起好步). http://www.xinhuanet.com/politics/leaders/2021-01/29/c_1127042572.htm

Xi, J. (2021b). Grasp the new development stage, implement the new development concept, and build a new development pattern (把握新发展阶段，贯彻新发展理念，构建新发展格局). *Qiushi 求是, 9*. http://www.qstheory.cn/dukan/qs/2021-04/30/c_1127390013.htm


