Norman Waite, Energy Finance Analyst
March 2022

Institute for Energy Economics and Financial Analysis
IEEFA.org

Central Banking and Climate Action – China Steers Credit to Decarbonize

PBOC Efforts to Promote Green Finance

Executive Summary

Many economists, politicians, and central bankers have been studying, theorizing, and debating the potential role central banking could play in the global effort to promote decarbonization and address climate change. There is little consensus, if any. However, the People's Bank of China (PBOC) has eschewed debate and quietly made efforts to green China's financial system for some time. Last year, in the wake of the Xi Administration's 30/60 pledge[1], PBOC efforts to foster more climate-friendly lending intensified. In 2021, the PBOC continued to take conventional actions but added measures that diverged from central bank orthodoxy and embraced policy experimentation. While the PBOC operates within China's unique economic, political, and financial environment, it would be a mistake to overlook these policies. Apart from its conventional measures, the more active measures the PBOC is taking to steer credit into decarbonization efforts can provide insight into central bank efforts in the rest of the world.

Central Banking and Climate Change

Central bank actions to address climate issues and carbon emissions remain inchoate. Central banks around the world agree that climate change is a serious financial risk, but there is little clarity or consensus on what central banks can do about it.[2] State banks tend to think in quarters or years, and generally aren't used to the kinds of long-term uncertainty that multiple climate scenarios present. Central banks also jealously guard their independence and are wary of actions that favor specific sectors or companies and threaten its market neutrality. Central banks may also be limited by their mandate or allowed only a supporting role in fiscal policies.[3]

The majority of central bank actions toward climate change to this point have therefore focused on the fundamental need for improved disclosure and risk

---

[1] Xi's pledge for China to reach CO2 emissions peak before 2030, and total greenhouse gas emission neutrality by 2060, made at the UN in September of 2020.

[2] In order to join, the more than 70 central banks members of the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) either had to show a track record of efforts to address climate change or commit to NGFS' mission to strengthen the "global response required to meet the goals of the Paris agreement."

[3] Analysis of state of central bank mandates, objectives, and involvement in climate change issues from: 1) Dikau, Simon and Volz, Ulrich. Central Bank Mandates, Sustainability Objectives and the Promotion of Green Finance. Grantham Research Institute, London School of Economics and Political Science, Latest Revision February 17, 2021. 2) Weber, Pierre-François, Alessandro Calza, et al. Survey on Monetary Policy Operations and Climate Change: Key Lessons for Further Analyses. NGFS Secretariat/Banque de France, December 2020.

discovery. Similar to efforts to locate subprime exposure in 2007 and 2008, initial central banking efforts have focused on locating climate risk exposure, estimating its magnitude, and assessing its potential long-term threat to price and financial system stability. In the process of this system risk discovery, central banks also improve broader financial market climate risk transparency.

Beyond risk discovery, central banks' use of active monetary policy measures to mitigate climate risks has been limited. Where they have been used, state banks have generally focused on collateral and asset purchase operations. In 2020, the European Central Bank (ECB) made certain sustainability-linked bonds eligible as collateral and purchase in its credit and monetary policy operations. By factoring in climate issues, positively or negatively, central bank lending practices and monetary policy operations influence financial flows toward more sustainable, less carbon-intensive enterprises and sectors. In the process, the central bank also defends its own balance sheet against financial risks.

Table 1: World's Largest Central Banks and their Green Finance Efforts

Major Central Banks	Assets (USD T)	NGFS Member Since	Green Central Banking Activities
EU Central Bank (ECB)	9.7	2018	Improved Disclosure and Stress Tests Green Bond Acceptance for Purchase & Collateral Mandate to Support EU Economic Policies
US Federal Reserve (FED)	8.7	2020	Research Climate Risks to Stability Monitoring Framework
Bank of Japan (BOJ)	6.4	2019	Improved Disclosure & Pilot Scenario Analysis Tests Climate Response Financing Operation
People's Bank of China (PBOC)	6.2	2017	Improved Disclosure and Green Finance Evaluations Green Loan & Bond Acceptance as Collateral Carbon Emission Reduction Facility

Source: Yardeni Research for January 2022 asset values, Dikau and Volz Research, various press sources.

Given the uncertainty around future climate scenarios and the lack of tested policy options, central banks have also feared implementing unproven policies that might produce little benefit and risk unintended consequences. Climate is a new type of financial risk, and central banks continue to study the threats and potential options available to address them. The US Federal Reserve (FED), for instance, has remained largely on the sidelines as it studies potential system risks and its latitude to address them within its mandate.[4]

Eight founding members established the Network for Greening the Financial System

[4] The Fed only began to take tentative steps to assess system banks' exposure to climate change risks last year, the last major central bank to begin to confront financial risks associated with climate change. Newburger, Emma. Fed Governor Anticipates New Guidance on Climate Change for Big Banks. CNBC, October 7, 2021.

(NGFS) in 2017 to address these problems.[5] The NGFS is designed to bring together global central banks and financial market regulators to advance understanding of climate issues, pool research on possible tools and solutions, and thereby establish international standards on which central banks and regulators can rely.[6] The NGFS now disseminates research on climate scenarios, financial and monetary policies, as well as disclosure of best practices to its over 70 central bank members around the world.[7]

PBOC Quietly Greens Chinese Finance

In 2017, before the founding of the NGFS, President Xi Jinping spoke at China's National Financial Work Conference and called on the financial sector to promote China's new development framework and its push for green finance.[8] The timing of the speech wasn't ideal, as China and the PBOC were engaged on multiple fronts to defend the country's financial system against the impacts of a disruptive trade war, a slowing economy, RMB fluctuations, and the ongoing but uneven domestic deleveraging effort. Apart from rate and reserve adjustments, PBOC innovations at the time mainly targeted broad segments of the economy, like its targeted medium-term lending facility for small and medium-sized enterprises (SME).

The PBOC has not been sitting still on green finance.

However, President Xi's speech may have been less of a call to action than a call for more action. The PBOC had hardly been sitting still on green finance before 2017. The PBOC's long-standing practice of guiding credit toward favored sectors and away from out of favor areas is well known, and those same tools had been used to steer credit toward green borrowers for some time.[9] In 2015, the PBOC released its

---

[5] Aside from the PBOC, the other seven founding members of the NGFS were Mexico's Banco de Mexico, the UK's Bank of England, France's Banque de France, Holland's De Nederlandsche Bank, Germany's Bundesbank, Sweden's Finansinspektionen, and Singapore's Monetary Authority.

[6] A good example was the March 2021 report on nine central bank policy options for climate risks, Adapting Central Bank Operations to a Hotter World: Reviewing Some Options, was produced by more than 15 central banks in five different continents, and reviewed by 87 member central banks and financial regulators.

[7] The NGFS has 105 total members (71 of which are central banks) and another 16 observers to the NGFS consisting of multilateral organizations.

[8] "为实体经济服务是金融的天职" Fang Yuanzhen. 全国金融工作会议在京召开 (National Financial Work Conference Held in Beijing). Xinhua via www.gov.cn, July 15, 2017.

[9] Called "window guidance," the PBOC employed both positive and negative lending guidance for green vs. brown borrowers starting in 2007 – the year China released its National Climate Change Program. The bank dropped negative guidance in 2014 and abandoned positive guidance in 2019.

first green bond taxonomy and guidance on green bond issuance.[10] Just one year before President Xi's speech, the PBOC joined six other Chinese ministries to publish China's Guidelines for Establishing the Green Financial System.[11] Those guidelines provided a comprehensive cross-agency plan for green finance.

Soon after President Xi's speech in 2017, the PBOC became one of the eight founding members of the NGFS. The only other major central bank among the founders was the Bank of England (BOE). The next year, in 2018, the PBOC included green bonds and loans among acceptable collateral for its medium-term lending facility[12] – two years before the ECB would take similar action. By the middle of COVID-saturated 2020, China's green lending totaled more than CNY11T, while outstanding green bonds reached CNY1.2T – first and second, respectively, in a global context.[13]

2021 – People's Green Bank

Despite substantial economic distractions after 2017, the PBOC continued to evolve its policy design toward more climate-friendly outcomes. Whether the PBOC was continuing its past efforts or responding to President Xi's 2017 speech seems debatable. In contrast, the PBOC's 2021 climate policies appear to be a more direct result of President Xi's Sept 2020 30/60 pledge. Before 2021 had started, the PBOC had announced it would prioritize the further greening of China's financial system and its support for green borrowers in 2021 in its 4Q20 Policy Report and 2021 Work Conference.[14]

The 4Q20 Work Report introduced PBOC's "five pillars" of green finance that it would build to support its climate efforts going forward.[15] Since then, the PBOC has ratcheted its climate actions higher with conventional, unconventional, and experimental measures in service of fortifying those pillars. The selection of measures below is not exhaustive, but it is indicative of the PBOC's intensification of decarbonization efforts last year.

Dikau, Simon and Volz, Ulrich. Out of the Window? Green Monetary Policy in China: Window Guidance and the Promotion of Sustainable Lending and Investment. Grantham Research Institute, London School of Economics and Political Science, May 2021.

[10] PBOC (translated by SynTao Finance).Notice of the People's Bank of China on Green Financial Bonds (PBoC Document No.39 [2015])., Dec 22, 2015.

[11] PBOC. Guidelines for Establishing the Green Financial System. September 2, 2016.

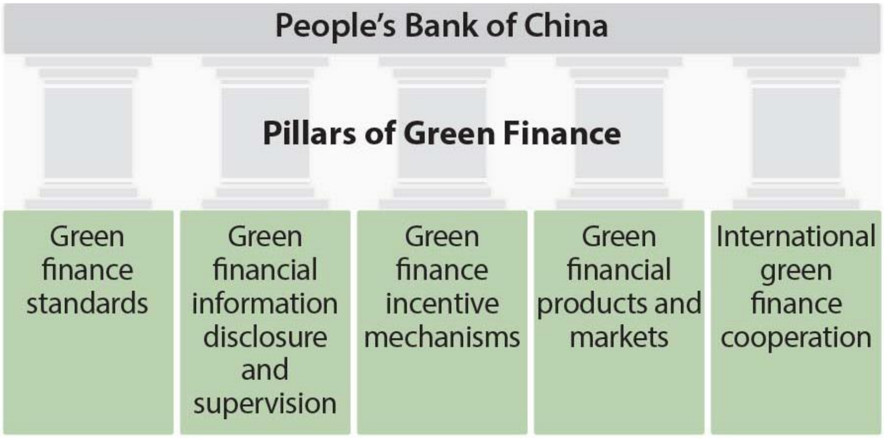
[12] PBOC. PBC Decides to Expand the Range of Acceptable Collaterals of Medium-Term Lending Facility. June 1, 2018.

[13] Numbers somewhat misleading as China "green" financing included clean coal until 2021. So-called "clean coal" better understood as cleaner coal – ie, technologies and facilities which are marginally more efficient and less emitting than current coal standards. PBOC. China's Green Loans See Rapid Growth in H1. August 1, 2020.

[14] 4Q20 Monetary Policy Report prioritized PBOC role in green development and 2021 PBOC Work Conference listed green finance as third priority behind prudent monetary policy and increased lending to SMEs, agriculture, and innovation concerns. 2021年中国人民银行工作会议召开 (2021 PBOC Work Conference), PBOC, Jan 6, 2021.

[15] Included in the 4Q20 Monetary Policy Report.

Figure 1: PBOC Pillars of Green Finance



Source: People's Bank of China, IEEFA research.

Conventional – Green Bonds

The PBOC's conventional measures in 2021 involved all its pillars. In April 2021, the PBOC, National Development and Reform Commission (NDRC), and Securities Regulatory Commission (CSRC) issued a revised green bond taxonomy that moved China closer to international green bond standards by eliminating 'clean coal' and other fossil fuel projects from the approved list.[16] This edition replaces China's original 2015 and revised 2018 catalogues. It is designed to strengthen PBOC pillars with improved standards, supervision, incentives, and products, as well as greater potential for cross border green market development.

PBOC's conventional measures in 2021 involved all its pillars.

Conventional – Green Finance Evaluation Program

The PBOC introduced its Green Financial Evaluation Program to assess green financial development among major system banks about a month later. The quarterly evaluation consists of both quantitative (80%) and qualitative (20%) measures and initially focuses on green loan and bond operations.[17] The evaluations

[16] 中国人民银行 发展改革委 证监会关于印发”绿色债券支持项目目录(2021年版)”的通知 (PBOC, NDRC, and CSRC Notice Regarding Publication of "Catalogue of Green Bond Support Projects (2021 Edition)") www.gov.cn, April 2, 2021.
[17] The program will expand to other green financial products in the future. Quantitative scores focus on concentration, growth, and risk, while qualitative scores are assessments of bank green

began in 3Q21. The PBOC plans to use system bank scores to inform its policy design and is encouraging banks to make their scores public to provide greater transparency to financial markets. The plan bolsters PBOC pillars with improved disclosure, better supervision, and ultimately more effective PBOC incentives and disincentives.

Unconventional – Jawboning with Other People's Money

The first major break from orthodoxy came with a conventional tool used in an unconventional way. Jawboning is the use of speech to persuade actors to affect a desired outcome. When central bankers use it, it's generally called macroprudential jawboning, as it is used to ensure financial stability, preserve the flow of financing, and defend against potential economic disruptions.[18] Famous examples were Mario Draghi's pledge that the ECB would do "whatever it takes" to calm fears of a collapse of the EUR, or Alan Greenspan warning of "irrational exuberance" in US equity markets to talk down a potential asset bubble.

Last year, the PBOC had a new take on macroprudential jawboning, which was more specific than previous central bank examples. In July of last year, two speeches by two Deputy Governors of the PBOC, spoke of the need for China's asset management industry to steer funding into Environmental, Social, and Governance (ESG) and green investments.[19] It is not unusual for central bankers around the world to speak about the need for more integrated, standardized, and efficient capital markets – green or otherwise.[20] It is unusual for a central banker to voice support for and encourage third party, non-system bank financial flows into a specific subsector of companies within those markets.

It is unusual for a central bank to encourage non-system bank financial flows into an investment subsector.

This suggests the PBOC is including climate risks as a threat to China's financial market stability. For China's central bank, this was therefore just macroprudential

finance policy formulation, implementation, and development. Green Finance Evaluation Plan for Bank Finance Institutions. PBOC

[18] PBOC Governor Yi Gang defined macroprudential policies in a 2018 speech as counter-cyclical measures aimed to ensure financial stability and forestall systemic risks. Yi Gang. China's Monetary Policy Framework – Supporting the Real Economy and Striking a Balance Between Internal and External Equilibrium. Via BIS, December 13, 2018.

[19] Chen Jia, Jiang Xueqing. PBOC to Guide Funds Toward Green-Edged ESG Investments. China Daily via www.gov.cn, July 27, 2021.

[20] ECB President Christine Lagarde, for instance, spoke last year of the need for a 'green capital markets union' in the EU as a way to improve transparency, distribute risk, and thereby improve funding potential for listed companies. This was not an endorsement of ESG or a sector but rather confidence in efficient capital markets. Lagarde, Christine. Towards a Green Capital Markets Union for Europe. ECB, May 6, 2021.

jawboning. The PBOC's goal was to grow green financial markets with this incentive to follow the bank's call, but they risk pushing domestic pension, insurance, and social security funds into environmental investments indiscriminately. Rather than improve or modify the market function to produce an outcome, the PBOC has simply asked for it instead. This manner of macroprudential jawboning could create the kind of wasteful overinvestment, greenwashing, and outright fraud that a central bank would ordinarily want to avoid. This PBOC action was fairly unorthodox for a central bank and not without unintended risks.

Experimental – Carbon Emissions Reduction Facility

The PBOC's policy experiment was initiated late in 2021 but was engaged by year-end. China's March 2021 Government Work Report pledged to introduce policies and devise instruments to support the financing of carbon emission reduction.[21] The PBOC responded with an announcement that it was studying a facility that would provide discounted central bank credit to banks lending to enterprises engaged in carbon emission reduction.[22] The PBOC finally launched the Carbon Emissions Reduction Facility (CERF) a few days after the Conference of the Parties (COP26) Finance meetings.[23]

In addition to monetary policy, a central bank generally functions as a lender of last resort. If financial flows are interrupted or seize up, a central bank can provide funding to banks to keep capital flowing. At times, central banks might try to steer that credit into areas where they are at higher risk. For instance, during the 2008 financial crisis and the COVID epidemic, a few central banks began to employ conditional interest rate targeted facilities to promote bank lending to small and medium-sized enterprises.

The central bank's use of conditional interest rate targeted lending facilities to promote decarbonization is relatively novel. A study by the NGFS in early 2021 found that conditional credit price targeted facilities could be one of the most effective central bank tools available to promote climate mitigation.[24] However, NGFS also cited significant operational challenges to such a policy, including program complexity, data integrity, and ill-defined labeling (e.g., "green"). The report stressed the importance and benefits of data for all potential central bank climate policy tools, but especially for conditional interest rate targeted lending facilities.

The PBOC is not the first major central bank to try this. In fact, the PBOC is not even the first major Asian central bank to try it. The Bank of Japan (BOJ) introduced the

---

[21] P.28 of Li Keqiang. Report on the Work of the Government. Via Xinhua, March 12, 2021.
[22] Li Xuelei. 央行将设立碳减排支持工具 引导金融资源流向绿色低碳产业 (Central Bank to Set Up Carbon Emission Reduction Support Tools To Guide Financial Flows to Green and Low-Carbon Industries) Xinhua via www.gov.cn, March 25, 2021.
[23] PBOC announced the CERF on November 8, 2021, just five days after PBOC governor attended the COP Finance Day on November 3. 人民银行推出碳减排支持工具 (PBOC Launches Carbon Emission Support Facility), November 8, 2021.
[24] Weber, Calza, et al. Adapting Central Bank Operations to a Hotter World: Reviewing Some Options. NGFS and Banque de France, March 2021.

details of its Climate Response Financing Operation (CRFO) just before the PBOC. Both programs dispersed their first funds in December 2021, with BOJ distributing nearly USD18B and the PBOC extending over 13B of credit to qualified banks.[25] The PBOC and BOJ are currently the two largest central banks to use targeted credit policy in this way, but the BOJ's CRFO operates within the context of Japan's negative interest rate environment, so it has a few eccentricities.[26]

The Bank of Japan is also experimenting with conditional credit pricing for decarbonization.

The CERF offers attractively priced funding to banks, conditional on loans extended to borrowers able to produce proven, audited, and consistent decarbonization results. The CERF provides banks with the option to refinance 60% of qualified loan principal at 1.75% from the PBOC. This would be an attractive source of one-year credit at the moment, just 25bps above deposit funding at 1.5% and at least 75bps below China's interbank and bond market funding above 2.5%.[27]

Currently, the CERF's list of qualified borrowers is among three target areas and their subsectors (Table 2). The PBOC can revise this list as the CERF proceeds. A bank can only rollover a loan twice at present.

The PBOC stipulates banks extend loans at or near the prime lending benchmark – currently 3.70%. This provision appears designed to avoid wasteful loan origination that can't stand up at prevailing rates. It is possible that banks may find ways to rebate interest to borrowers who receive and retain CERF qualifications, but that would likely be the result of banks competing for a limited group of qualified borrowers. This wouldn't appear to be a near-term issue, as PBOC data show green loans are growing at least twice as fast as overall lending and making up over 13% of total loans in 2021. Based on PBOC data, IEEFA estimates Chinese system banks extended over CNY1.7T (USD270B) of credit to firms engaged in direct and indirect carbon reduction efforts last year. Even if the CERF created lending competition, the PBOC could always broaden the facility to other subsectors or eliminate the use of credit in saturated spaces.

---

[25] Outline of Climate Response Financing Operations. Bank of Japan, September 22, 2021.
[26] For example, the CRFO responds to Japan's negative interest rates with incentives for non-negative (0%) interest on financial institution current account balances set against CRFO loans and investments at the BOJ. Establishment of "Principal Terms and Conditions of the Funds-Supplying Operations to Support Financing for Climate Change Responses". Bank of Japan, September 22, 2021.
[27] Bloomberg shows actively traded Chinese commercial bank bonds issued onshore since October of 2021 yielding over 2.5% and China's 12m SHIBOR priced above 2.6%. Bank deposits would be cheaper, with PBOC benchmark set at 1.5%, but Chinese banks average only about 60% of funding from their deposits.

Table 2: Carbon Emission Reduction Facility Targets

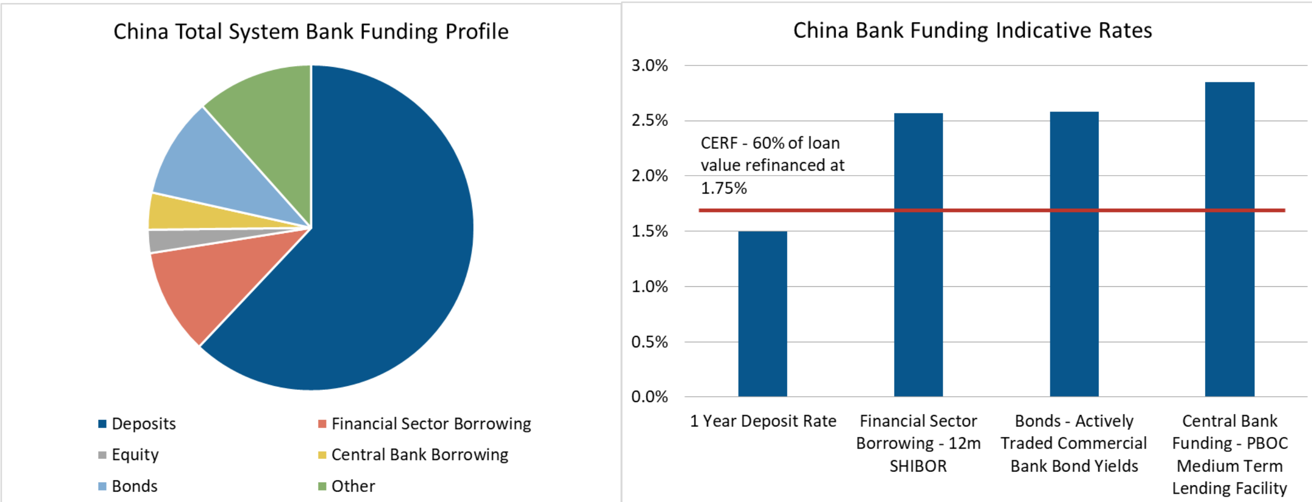
Target Areas	Clean Energy	Energy Conservation and Environmental Protection	Carbon Reduction
Subsector	*Wind Power Generation* *Solar Energy Use* *Biomass Energy Use* *Pumped Storage* *Hydrogen Energy Use* *Geothermal Energy Use* *Tidal Energy Use* *Heat Pumps* *High-Efficiency Energy Storage* *Smart Grid* *Large Scale Wind, Solar, Storage integration* *Household Distributed Solar* *Cross-Regional Clean Power Transmission* *Emergency Backup Power* *Peak-Shaving Power*	*Industrial Energy Efficiency* *New Power Systems*	*Carbon Capture, Utilization, and Storage*

Source: PBOC.

Like the BOJ's CRFO, the PBOC CERF keeps loan risk in the system bank's hands. The CERF stipulates that banks make their own decision to lend to potential qualifying borrowers on prevailing economic terms. Only after those loans have been extended can a bank seek access to cheaper CERF refinancing. The PBOC reviews bank loan portfolios to assess what qualifies and then offers CERF refinancing to the portion of the portfolio which does. This loan first, borrow later structure, also known as refinancing, distances the PBOC and the BOJ from lending decisions and maintains a degree of market neutrality.

The PBOC also gains other advantages with this refinancing structure. The CERF requires banks to provide audited carbon emission reduction results on CERF loans to the PBOC and to the public. This discounted CERF funding thereby incentivizes system banks to improve green lending transparency, broaden credit assessments to include decarbonization, cultivate a carbon accounting and auditing ecosystem, standardize carbon accounting best practices, and raise information supervision within lending portfolios.

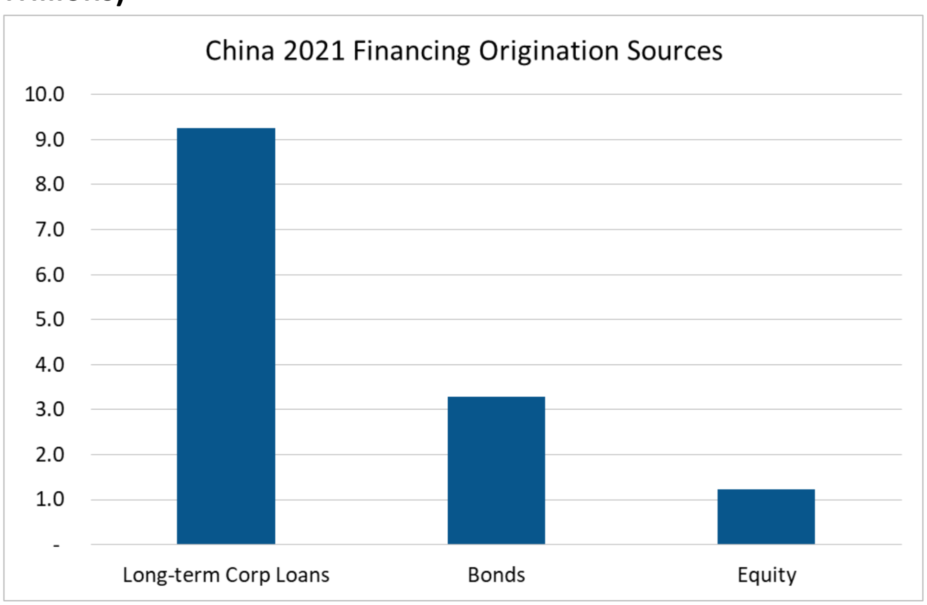
Figure 2: China System Bank Funding, Composition and Pricing



Source: PBOC, CBRC, Bloomberg, IEEFA research.

The CERF could have a substantial impact on financing China's carbon reduction. Commercial banks are the primary funding source for any company's growth. In China, bank loans are also the largest source of corporate funding by a wide margin – supplying 2.8X that of bonds and 7.4X that of equity last year (Figure 3).[28]

Figure 3: China Financing Origins for New Corporate Credit (2021, CNY Trillions)



Source: PBOC, Bloomberg, IEEFA research.

---

[28] Based on PBOC data for non-financial corporates and excluding short-term loans. Bond financing figure unadjusted to exclude short-term bonds below one year expiry, so is overstated.

The PBOC extended its first CERF refinancing in December of CNY85.5B of refinancing to CNY142.5B eligible bank loans. PBOC 4Q21 data show a growth of CNY770B in system loans to companies engaged in direct and indirect carbon reduction, or around CNY257B each month. The CNY142.5B December CERF approvals imply that the PBOC approved at least 50% of eligible carbon reduction loans that originated in December.

The PBOC refinanced loans to 2,817 borrowers promising to cut 28.76M tons of annual carbon emissions. That is 0.8% of China's annual carbon dioxide (CO2) emissions from coal power. If the PBOC keeps this pace every month for 2022, the CERF could add significant cuts to the country's CO2 by year-end. This is a strong start, but the CERF's real test will come as emission reduction results come through, third-party audits are conducted, and the PBOC assesses both for rollover.

Curious – Clean Coal Refinancing

Just a week after the PBOC announced the CERF, China's National Standing Committee established a CNY200B refinancing facility to support bank lending efforts that promote the clean and efficient utilization of coal.[29] The State Council's new facility came in the wake of China's dramatic 3Q21 coal supply crunch and subsequent power outages, so it was not a complete shock. However, the PBOC's action to support the coal sector so soon after appearing to promote decarbonization just a week earlier appeared incongruous.

It is unclear whether this clean coal facility was ever a PBOC policy. We find no documentation regarding a clean coal refinancing facility on the PBOC website – no press release, policy description, or press conference transcript. By contrast, the PBOC website hosts both a press release and a transcript of a press conference regarding the CERF shortly after it was announced – both in Mandarin and translated to English. Deputy PBOC governors have recently begun to talk about this facility alongside the CERF, but the lack of any PBOC document on this topic in a document-driven system like China's is notable.[30]

This clean coal refinancing policy is also notable for two other reasons. First is the policy's small CNY200B size. Compare this to the CNY85.5B in CERF refinancing provided in December alone – more than 40% of the total size of this clean coal facility dispensed within a single month. The other thing notable about this policy is its very existence. While its small size suggests it may be mainly for show, it is surprising that China's Standing Committee feels the need to display state support for coal mining and thermal coal power to system banks. Are PBOC efforts to green the country's financial system potentially becoming too successful?

---

[29] Wu Yu. 我国设立2000亿元支持煤炭清洁高效利用专项再贷款. (China Establishes Special CNY200 Billion Refinancing Facility to Support Clean and Efficient Coal Utilization) Xinhua via www.gov.cn, November 18, 2021.
[30] Sun Guofeng, Director of PBOC Monetary Policy Department. 孙国峰：2022年货币政策将重点围绕四方面开展工作 (Monetary Policy will Focus on Four Aspects in 2022) Sina Finance, January 28, 2022.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

About the Author

Norman Waite

Norman Waite has analyzed, assessed, and distributed both public and private financial instruments in Asia, mainly to hedge fund investors, since 1996. He has covered US waste management and Asian paper and forest products as an equity research analyst.