China Green Finance Status and Trends 2022-23

Dr. Christoph NEDOPIL, Ziying SONG

Green Finance & Development Center, FISF Fudan University

January, 2023

This report was prepared with support from the International Institute for Sustainable Development (IISD) as a scoping study for the China Council for International Cooperation on Environment and Development (CCICED). The report does not reflect official positions from either of the organizations.

Please quote as:

Nedopil, Christoph and Song, Ziying (January 2023): "China Green Finance Status and Trends 2022-23", Green Finance & Development Center, FISF Fudan University, Shanghai.

Contact:
For inquiries, please contact the Green Finance & Development Center
info@greenfdc.org

Contents

List of Figures

List of Tables

1. Executive Summary and Introduction

Green finance plays a key role in providing relevant instruments and tools to finance China's green ambitions enshrined in China's "1+N" policy system[1] to achieve "dual carbon" goals announced in March 2021[2] to peak carbon emissions before 2030 and become carbon neutral by 2060.

Achieving that goal requires additional (beyond "business as usual") annual investments of about USD300 billion[3] and a total of RMB2.2 trillion between 2022 and 2030 (about 5% of China's 2019 GDP).

Possibly not included in these numbers are costs for reducing stranded asset risks by accelerating phasing out the operation of high-emitting activities.

Yet, while China started to systematically establish its green financial system in 2016 through the *Guidelines for Establishing the Green Financial System*[4], progress by 2022 has been mixed: China has seen "green" success, for example in becoming home to the largest solar and wind power installations, and by leading the sales of new energy vehicles. At the same time, China has expanded financial and administrative support for coal mining, coal-fired power

[1] 1+N policy system refers to "1" overarching policy for carbon peaking and carbon neutrality, and "N" sector guidance and policies.
[2] 国家发展和改革委员会, "国家发展改革委环资司召开碳达峰、碳中和专家座谈会(The National Development and Reform Commission's Environmental Protection Division held a carbon peak and carbon neutral expert symposium)," March 22, 2021, https://www.ndrc.gov.cn/fzggw/jgsj/hzs/sjdt/202103/t20210322_1269949.html?code=&state=123.

[3] Ma, T. Researchers unveil roadmap for a carbon neutral China by 2060. China Dialogue, 2020, https://chinadialogue.net/en/climate/researchers-unveil-roadmap-for-a-carbon-neutral-china-by-2060/
[4] "The People's Bank of China Issued the 'Guidelines for Establishing the Green Financial System' - UN PAGE - Partnership for Action on Green Economy," accessed November 11, 2022, https://www.un-page.org/news/the-peoples-bank-of-china-issued-the-guidelines-for-establishing-the-green-financial-system/.

plant operators, and coal-fired power plant construction. This "panda-dragon" approach has led, for example, to an increase in the share of renewable electricity from 26.3% in 2015 to 31.9% in 2022[5], but also an increase in total CO2 emissions by 15% from 2015 to 2021.[6]

To further utilize and expand the potential of green finance in China, the government's role is indispensable in China's top-down system. Central government sets out the framework and strategic plan for green finance, and subnational governments as well as other key stakeholders work collectively to facilitate its implementation. According to this model, China continues to improve its green finance policy system, encompassing top-level design, green finance instrument development, environmental rights trading (e.g., carbon trading) pilot zones, disclosure standards, incentive mechanisms, transition finance, and international cooperation.

This brief analyzes recent developments in China's green finance policies and tools and puts them into perspective to identify barriers and recommendations to further scale green finance. It is a snapshot of various developments and uses specific examples to understand trends and directions. It is by no means a complete guide to Chinese green finance and its developments.

Key barriers for green finance in China identified include (more details in chapter 5):

1. **Lacking incentives for green over brown finance**. While China's latest green bond catalogue (2021) removed coal-fired power plants, it still includes upgrading coal-burning industrial boilers in the 'energy efficiency' category and thus expands lifecycles. In addition, **financial incentives for brown assets have partly expanded,** for example in November 2021, PBOC installed an RMB 200 billion (USD31 billion) relending program for clean coal.
2. **Overlap of competencies between various ministries' responsibilities and between the central and local governments may lead to overlapping standards and practices**. An example is the development work of green finance led by PBOC, while MEE is responsible for climate finance and SASAC leads green finance development for state-owned enterprises (SOEs). It may lead to "supervisory duplication" or "regulatory gap".
3. **Green finance as a share of the total markets remains low** and an unbalanced structure **exists in green financial products**. Green credit and bonds are the main drivers of the current green finance market, while other instruments have a positive momentum but are relatively weakly developed.
4. **Green financial instruments need expansion**: For example, a standard

[5] Gavin Maguire, "Column: China on Track to Hit New Clean & Dirty Power Records in 2022," *Reuters*, November 23, 2022, sec. Energy, https://www.reuters.com/business/energy/china-track-hit-new-clean-dirty-power-records-2022-maguire-2022-11-23/.

[6] M. Crippa et al., *CO2 Emissions of All World Countries 2022 Report.*, JRC130363 (LU: Publications Office of the European Union, 2022), https://data.europa.eu/doi/10.2760/730164.

for carbon neutral bonds has not been developed yet, and it is important as China is promoting carbon sinks and ecological product value realization

5. **Lack of enabling and robust disclosure standards.** Although domestic market regulators have explained the environmental disclosure requirements of various green finance instruments, there is a lack of framework and operable disclosure guidelines (e.g., for green bonds).
6. **Lack of oversight and punishment**. While MEE is publicly shaming companies for falsifying reports (e.g., as in the emission data), overall oversight capacity remains low. Similarly, violations are punished lightly, e.g., failing to provide ESG reports has fines of 100,000 (about USD15.500)[7].
7. **Lack of capacity and incentives within financial institutions**, where capacity building is predominantly driven by top-down implementation guidance, while participation in international standards setters and related bodies (e.g., GFANZ, Equator Principles, PRI) is little.

Internationalization of Chinese green finance remains low, despite some good progress on national level cooperation (e.g., G20, NGFS) and the BRI, however not regarding international investors being invested in green finance in China's domestic market and Chinese international collaboration on the financial institution level. **Error! Reference source not found.** provides specific recommendations to improve green finance development in China categorized based on their potential impact on shifting finance from brown to the green and likely difficulty of implementation (more details in chapter 5):

[7] 生态环境部, "企业环境信息依法披露管理办法-第五章罚则 (Measures for the Administration of the Lawful Disclosure of Enterprise Environmental Information - Chapter V Penalties)," December 2021, https://www.mee.gov.cn/gzk/gz/202112/t20211210_963770.shtml.

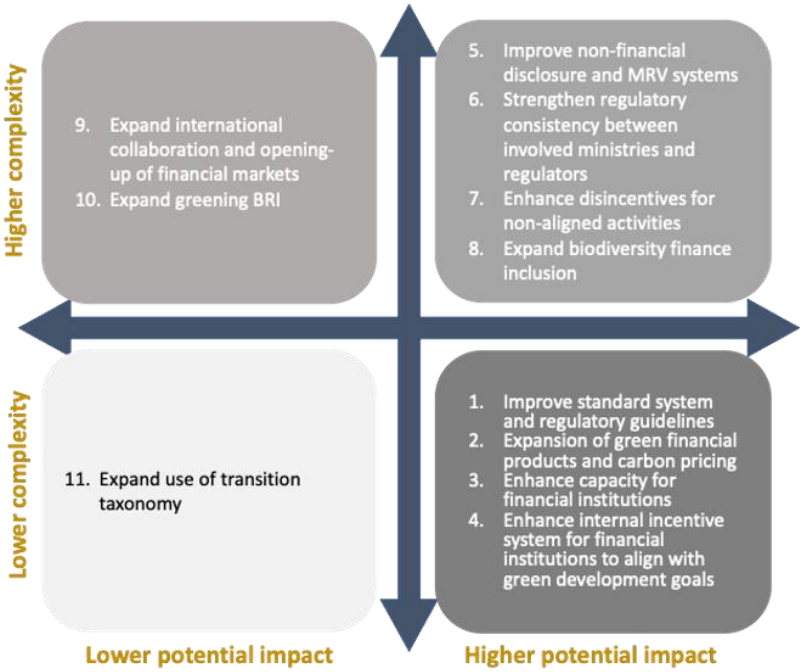


Figure 1: Heat map of potential actions on green finance development (source: authors)

1. **Improve and strengthen green finance standards, guidelines, and supporting regulatory systems.** Regulators and major financial institutions can formulate articulate, mandatory, and normative green financial policies and requirementsto prevent market loopholes to reduce greenwashing. This could include

4. financial institutions can expand cooperation based on existing networks such as China Banking Alliance, Green Finance Committee, Green Finance Leadership Program, and BRIGC, with new networks and partners (e.g., universities)
5. **Enhance internal incentive and restraint polices' for financial institutions.** Regulators could incorporate more criteria for banking and other financial institutions' green finance evaluation, e.g., based on their ability to provide consistent

2. **Enlarge green finance in the market and expand green finance products**. Policy signals and diversified green finance products can bring more players into the market and expand green finance to boost market vitality
3. **Enhance capacity building for financial institutions.** Regulators, research institutions, NGOs, and measurement, reporting, and validation of data.
6. **Advance non-financial disclosure standards and their application for financial institutions and corporations.** Policymakers should set more stringent rules (with more severe punishment) on ESG disclosure in line with association-based standards (e.g., TCFD, TNFD) and with strong support for international standards (e.g., ISSB).
7. **Strengthen consistent regulation and reduce regulatory complexity.**

Regulators (e.g., NDRC, MEE, PBOC, CBIRC, CSRC) could strengthen cooperation amongst each other and designate a focal point for green finance with top-level authorization to ensure higher consistency among regulators and initiatives and reduce complexity for green finance.

8. **Enhance disincentives for non-green activities**. Regulators should curb activities with plausible yet hard-to-ascertain environmental benefits. A foundation would be the expansion of polluting industry and activity definitions, possibly through a red finance taxonomy (like the already existing traffic light system for BRI projects that includes a "red" or discouraged activity category
9. **Expand international cooperation.** China is a key contributor to global green finance development through collaboration with and leadership in international bodies (e.g., G20 Sustainable Finance Working Group, NGFS, IPSF). China can expand its cooperation for non-financial disclosure in both government-supported bodies (e.g., ISSB for ESG standards) and in voluntary standard setters (e.g., TNFD, TCFD, Equator Principles).
10. **Expand biodiversity finance**: China has started to include biodiversity considerations in finance through some high-level guidances. Through improved domestic and international collaboration on biodiversity finance (e.g., TNFD), China could expand domestic capacity.
11. **Expand greening of BRI:** China's cooperation with BRI countries can be strengthened to expand capacity and knowledge in BRI countries on China's green finance progress and green finance stipulations in various green finance guidelines and guidances. By having BRI countries become aware and thus require higher green finance standards in line with Chinese guidances and opinions, Chinese players would overcome the non-interference requirement of China's overseas finance, as green development requirements would be asked for by the recipient countries.
12. **Expand transition taxonomy:** Transition finance is important to provide finance for hard-to-abate sectors in their transition. Yet, at this point, it is unclear whether transition finance can be successful in quickly reducing emissions and protecting nature due to unclear or insufficiently ambitious transition paths. Possibly it would be more relevant to provide more stringent bottom-up transition taxonomies, e.g., based on timelines of having to transition out of specific activities based on a red taxonomy, as suggested by the G20 Climate and Sustainability Working Group.

2. China Green Finance Policy Landscape

2.1 China's Top-Down Green Finance System

The development of green finance in China is rooted in China's top-down political

economy mode[8], where central governments and regulators (compared to e.g., financial associations or markets) play a guiding role by

- Setting the direction for green financing development through policies, guidance, and regulations, including top-level design, evaluation system, taxonomies, and disclosure;
- Leveraging public finance's support, such as establishing green development fund, etc.; and
- Creating an enabling environment for the market such as incentive policies.

China's top-down market steering approach[9] can be contrasted with a bottom-up market facilitation approach in the EU[10] and the US. As a result, for example, Chinese institutions had not issued any green bonds before 2015, but once relevant regulations supporting green bonds were issued by the central government, China became the world's largest issuer in 2016.

Multiple ministries and regulators are responsible for green finance (see Figure 2), where green finance leadership tends to fall to the People's Bank of China (PBOC). The ministries involved in China's green financial development and their responsibilities are described in Appendix 2.

Figure 2: Overview and relations between bodies governing green finance (Source: Nedopil and Larsen, 2022)

Furthermore, pilots are being set up under the central level top-design. Pilot local governments developed their own green finance ecosystem and implemented detailed policy/regulations based on a central policy framework with localization and innovative practices, which greatly led the green finance development across the country. The goal of these pilots is ultimately to determine the effectiveness of different green finance policies and then implement

[8] Barry Naughton, "Grand Steerage," in *Fateful Decisions: Choices That Will Shape China's Future* (Stanford University Press, 2020), 51–81.
[9] Yao Wang, "China's Green Finance Strategy: Much Achieved, Further to Go," *Grantham Research Institute on Climate Change and the Environment*, 2018, https://www.lse.ac.uk/granthaminstitute/news/chinas-green-finance-strategy-much-achieved-further-to-go/.
[10] Mathias Lund Larsen, "Intersecting Interests and Coincidental Compatibility: How China, the EU, and the United States Can Coordinate Their Push for Globalizing Green Finance," *Georgetown Journal of International Affairs* (blog), July 15, 2021, https://gjia.georgetown.edu/2021/07/15/intersecting-interests-and-coincidental-compatibility-how-china-the-eu-and-the-united-states-can-coordinate-their-push-for-globalizing-green-finance/; Christoph Nedopil, Truzaar Dordi, and Olaf Weber, "The Nature of Global Green Finance Standards—Evolution, Differences, and Three Models," *Sustainability* 13, no. 7 (March 26, 2021): 3723, https://doi.org/10.3390/su13073723.

these at the national and international levels. This enabled, for example,

- the city of Shenzhen in March 2021 to implement China's first green finance law[11], requesting listed financial companies registered in Shenzhen to disclose environmental information from the beginning of 2022.
- In July 2022, Shenzhen issued disclosure guidance[12] to further facilitate unified environmental disclosure work of financial institutions; Guangdong's government issued a plan for developing green finance to support carbon peak and neutrality[13];
- The city of Chongqing established itself as a green finance pilot zone with the goal to create a "Yangtze River Green Finance Corridor"[14];
- The city of Huzhou issued a guideline[15] on financing biodiversity with the goal to establish more innovative financing tools and relevant targets for biodiversity conservation; and
- In September 2022, Beijing issued an action plan to accelerate the construction of a global green finance and sustainable financial center with full-service research, decision-making, and market operation.[16]

Figure 3 provides an overview of **green finance pilot zones** of the first and second batches and their focus for accelerating green finance.

[11] 深圳市人民代表大会常务委员会, "深圳经济特区绿色金融条例--深圳市法规及规章[Shenzhen Special Economic Zone Green Finance Regulations--Shenzhen City Laws and Regulations]," November 2020, http://www.sz.gov.cn/cn/xxgk/zfxxgj/zcfg/szsfg/content/post_8290626.html.

[12] 深圳市地方金融监督管理局等, "关于印发《深圳市金融机构环境信息披露指引》的通知[Notice on Issuing the "Guidelines for Environmental Information Disclosure of Financial Institutions in Shenzhen"]," September 30, 2022, http://jr.sz.gov.cn/sjrb/ydmh/isz/zcfg/szsjrzc/jrfzzc/content/post_10150984.html.

[13] 广东省人民政府办公厅, "关于印发广东省发展绿色金融支持碳达峰行动实施方案的通知(Notice on Issuing the Implementation Plan of Guangdong Province to Develop Green Finance to Support Carbon Peak Action)," July 2022, https://www.gd.gov.cn/zwgk/wjk/qbwj/ybh/content/post_3972447.html.

[14] 人民网, "绿色金融改革创新试验区再扩容 积累我国绿色金融体系-重庆经验(The Green Finance Reform and Innovation Pilot Zone will be expanded again to Chongqing to accumulate experience of China's green finance development)," August 2022, http://finance.people.com.cn/n1/2022/0828/c1004-32513183.html.

[15] 湖州市人民政府, "关于金融支持生物多样性保护的实施意见(Huzhou Municipal Government: Implementation Opinions on Financial Support for Biodiversity Protection)," August 2022, http://www.huzhou.gov.cn/art/2022/8/15/art_1229561845_1667141.html.

[16] 北京市地方金融监督管理局等, "《'两区'建设绿色金融改革开放发展行动方案》(Beijing Local Financial Supervision and Administration Bureau: "Action Plan for Reform and Opening-up Development of Green Finance in 'Two Districts'"), " August 2022, http://www.igea-un.org/cms/show-6669.html.

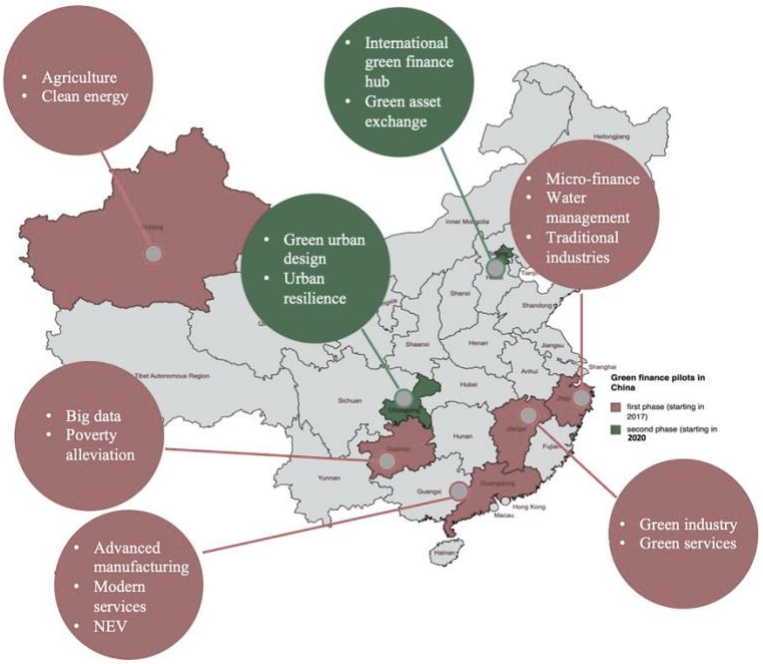


Figure 3: Overview of provincial and municipal green finance pilots and initiatives (Source: Authors' visualization).

As work on tackling climate change had been partly designated to the Ministry of Ecology and Environment (MEE), MEE established separate climate finance pilot zones (distinct from green finance pilots). This overlap can possibly create extra learning and inefficiencies. In August 2022, 23 cities were approved as the first batch of pilot cities[17].

Provincial and city government offices support and partly implement national green finance policies through local DRCs (development of reform commission, the local level ministry of the NDRC), the Bureau of Finance, or the Bureau of Ecology and Environment. Furthermore, non-government stakeholders implemented and support the green financial system (see Table 1)

Table 1: Non-government drivers of China's green finance

Financial institutions	Market exchanges	Financial associations	Service providers

[17] 23 pilot cities: Miyun District and Tongzhou District of Beijing, Baoding City of Hebei Province, Taiyuan City and Changzhi City of Shanxi Province, Baotou City of Inner Mongolia Autonomous Region, Fuxin City and Jinpu New District of Liaoning Province, Pudong New District of Shanghai City, Lishui City of Zhejiang Province, Chuzhou City of Anhui Province, Sanming City of Fujian Province, West Coast New District of Shandong Province, Xinyang City of Henan Province, Wuchang District of Wuhan City of Hubei Province, Xiangtan City of Hunan Province, Nansha New District of Guangdong Province, Futian District of Shenzhen City, Liuzhou City of Guangxi Zhuang Autonomous Region, Liangjiang New District of Chongqing City, Sichuan Province Tianfu New District, Xixian New District of Shaanxi Province, Lanzhou City of Gansu Province, Baoding City of Hebei Province, 生态环境部等, "关于公布气候投融资试点名单的通知(Mnistry of Ecology and Environment:Notice on Publishing the List of Climate Investment and Financing Pilots)," August 2022,https://www.mee.gov.cn/xxgk2018/xxgk/xxgk04/202208/t20220810_991388.html.

• main bodies for the effective execution of green finance policies in China based on green loans; • implement policies through capacity building, establishing concrete rules of green finance; • working with different stakeholders to release green finance products; • Some banks perform stress tests and scenario analysis (for climate risks).	• provide limited guidelines to steer green finance, e.g., ESG disclosure regulations (e.g., Shanghai Stock Exchange, Shenzhen Stock Exchange, and Beijing Environmental Exchange)	• Associations, such as the National Association of Financial Market Institutional Investors (NAFMII), explore rules and principals for innovative green finance products, • provide capacity and standards.	• Provide services, including assessment and certification work of green bonds. • Their role has been elevated in November 2022 to take more responsibility in reducing greenwashing

2.2 Recent Green Finance Policies in China

The following sections highlight and analyze recent green finance policy developments in China based on the five pillars[18] for green finance development promulgated by PBOC in early 2021:

1. Improve the green finance standard system;
2. Strengthen regulation and disclosure requirements;
3. Enhance the incentive and restraint mechanisms;
4. Enrich the product and market system; and
5. Expand international cooperation and lead the setting of international standards for green finance.

Standard system

At the beginning of 2022, PBOC, State Administration for Market Regulation (SAMR), China Banking and Insurance Regulatory Commission (CBIRC), and China Securities Regulatory Commission (CSRC) issued the *Fourteenth Five-Year Plan for*

[18] 人民网, "陈雨露：绿色金融'三大功能''五大支柱'助力碳达峰碳中和 (Vice governor of PBOC Chen Yulu: Green Finance's "Three Functions" and "Five Pillars" Help Carbon Peak Carbon Neutralization)," March 2021, http://finance.people.com.cn/n1/2021/0307/c1004-32044837.html.

Financial Standardization Development[19]. The Plan identifies key tasks and goals over the next five years, including setting up *"domestic united, international aligned", clear and enforceable green finance standards on ESG disclosure and assessment, carbon accounting for financial institutions, loan statistics, carbon finance, and transition finance.*

Noteworthy developments in green finance standard systems include:

- For banks: In June 2022, the CBIRC issued the *Guidelines for Green Finance in the Banking and Insurance Industry* (*银行业保险业绿色金融指引*), raising green finance in the banking and insurance industry to a strategic level. This **guideline brings** the **non-credit business of banking institutions, the insurance industry's underwriting, and asset management business into the green finance scope**, which will ideally mobilize more green finance. The Guidelines also require that environment, social, and governance (ESG) factors shall be included in the management process and comprehensive risk management system.
- For green taxonomies: In July 2022, the Green Bond Standards Committee officially released the *China Green Bond Principles (中国绿色债券原则)*[20]. **The new principle further unified the domestic green bond market and was designed to be more aligned with international standards**. A noteworthy enhancement is that it requires 100% of the proceeds to fund green projects, instead of 50-70% previously, which is a positive signal to attract foreign investors that are concerned about potential greenwashing. This comes after China was the first country to launch a green bond taxonomy in 2015 by the PBOC[21]. In 2019, the NDRC[22] released *Green Industry Catalogue* relevant for green credit and SOEs. Later, the PBoC, NDRC, and CSRC updated and joint *Green Bond Project Endorsed Catalogue (2021 version)* in 2021[23]. The new catalogue brought some important changes to China's taxonomy of sustainable finance – clean use of coal and several fossil fuel (gas and liquefied natural gas (LNG)) projects were removed from the definition of 'eligible green project'. This was noticeably different from the European Union (EU)'s green

[19] 中国政府网, "四部印发《金融标准化'十四五'发展规划》(PBOC, SAMR, CBIRC, CSRC issed the "Fourteenth Five-Year Development Plan for Financial Standardization")," February 2022, http://www.gov.cn/xinwen/2022-02/09/content_5672688.htm.

[20] "Chinese Green Bonds Required to Use 100% of Funds for Green Purposes," *China Dialogue* (blog), August 2022, https://chinadialogue.net/en/digest/chinese-green-bonds-100-percent-funds-for-green-purposes/.

[21] PBoC. Green Bond Endorsed Project Catalogue (人民银行：绿色债券支持项目目录), 2015.

[22] NDRC et al. Green Industry Guiding Catalogue (2019 version) (国家发展和改革委员会，工业和信息化部，自然资源部，生态环境部，住房城乡建设部，人民银行，国家能源局: 绿色产业指导目录（2019 年版)). https://www.ndrc.gov.cn/fggz/hjyzy/stwmjs/201903/W020200217416444788586.pdf.

[23] PBoC. Green Bond Endorsed Project Catalogue (中国人民银行, 发展改革委, 证监会《绿色债券支持项目目录（2021 年版)》). http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4236341/index.html.

taxonomy, which classified gas as a sustainable investment[24].

In general, the green industry catalogue serves as a unified standard blueprint for green classification at the Chinese ministries and commissions level. Based on the green industry and green bond catalogues, sub-level governments especially pilot zones have developed localized taxonomies and project databases to facilitate green finance. Their international alignment has also been explored (see next section).

Box 1: Key trends in China's green finance standard system

Positive trends:	Other trends:
• More detailed standards for green bonds in line with international standards (e.g., less fossil fuel, 100% of proceeds must be used for green); • More detailed standards for green banking, including improved governance requirements and green banking evaluation systems.	• No acceleration of standards for non-aligned projects; • Absence of the technical path, entry threshold, and financial standards for transition finance; • Overlap between responsible entities in developing green finance – government (including banks and financial institutions) with experience (mostly in pilot or initiatives).

Disclosure Policy

Environmental, social, and governance (ESG) information disclosure of enterprises and financial institutions reduces information asymmetries to ideally reduce greenwashing and accelerate financing for green development. MEE and PBOC are key policy stakeholders promoting disclosure policies for corporations and financial institutions, respectively. Local exchanges also provide mandatory disclosure requirements for listed companies.

- **For corporations**, MEE released two documents in May and Dec 2021: the *Reform Plan for Mandatory Environmental Disclosure System* and the *Administrative Measures for Enterprise Environmental Disclosure*[25]. The former serves as a **systematic roadmap for the construction of China's mandatory environmental disclosure system in the next five years**; the latter further clarified disclosure entity, content, format, and procedures. One of the disclosure focuses is carbon emission data. This could be a tentative attempt and a policy signal for a

[24] Catherine Clifford, "Europe Will Count Natural Gas and Nuclear as Green Energy in Some Circumstances," CNBC, July 6, 2022, https://www.cnbc.com/2022/07/06/europe-natural-gas-nuclear-are-green-energy-in-some-circumstances-.html.

[25] Ministry of Ecology and Environment. Measures for the Administration of Legal Disclosure of Enterprise Environmental Information (生态环境部: 企业环境信息依法披露管理办法), 2021.

further step toward mandatory climate disclosure in the future.

- **For state-owned enterprises (SOEs)**, the State Council's Assets Supervision and Administration Commission (SASAC) established the Social Responsibility Bureau and issued **a workplan to stipulate SOEs achieve ESG disclosure by 2023**[26]. It also stressed the requirement to establish and improve statistical accounting and information disclosure for carbon emissions, and effective measures to control carbon emissions for state-owned enterprises at a meeting in September 2022[27]. As the main players in economic activities, SOEs serve as a focal point for government to accelerate progress on carbon reduction, ESG disclosure, and green finance.
- **For listed companies**
    - CSRC issued revised guidelines for the format and content of annual reports and semi-annual reports of listed companies in June 2021, **requiring setting up a separate section of "Environmental and Social Responsibility" in the reports** It further encourages the disclosure of carbon emission reduction measures and results[28].
    - In January 2022, Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) both updated guidelines for listed companies, proposing that certain companies (i.e., SSE: listed companies, SZSE: "Shenzhen 100" sample companies and Growth Enterprise Market (GEM) listed companies) "should" publish environmental and social responsibility report together with annual reports[29,30].
    - SSE also released an internal notice, mandating Science and Technology 50 sample companies to disclose ESG reports along with their annual reports and shall

[26] 生态中国网, "国资委:力争 2023 年央企上市公司 ESG 专项报告披露'全覆盖 (SASAC: Strive to achieve 'full coverage' on ESG disclosure of listed companies of state-owned enterprises in 2023),'" May 2022, https://www.eco.gov.cn/news_info/55577.html.

[27] 中国政府网，"国资委要求中央企业"一企一策"制定碳达峰行动方案 (SASAC requires central enterprises to formulate carbon peak action plan "one enterprise, one plan")"， October 2022, http://www.gov.cn/xinwen/2022-10/07/content_5715977.htm.

[28] 中国证券监督管理委员会, "证监会发布修订后的上市公司年度报告和半年度报告格式准则 (CSRC: the revised guidelines for the format of annual reports and semi-annual reports of listed companies)," June 2021, http://www.csrc.gov.cn/csrc/c100028/cb25156c4913f4c9ea6b658cad8011f17/content.shtml.

[29] 上海证券交易所, "关于发布《上海证券交易所上市公司自律监管指引第 1 号——规范运作》的通知 (Shanghai Stock Exchange Guidelines No. 1 for Self-Regulatory Supervision of Listed Companies—Standardized Operation)," January 7, 2022, http://www.sse.com.cn/lawandrules/sselawsrules/stock/main/listing/c/c_20220107_5679270.shtml.

[30] 深圳证券交易所, "关于发布《深圳证券交易所上市公司自律监管指引第 1 号——主板上市公司规范运作》的通知 (Shenzhen Stock Exchange Guidelines for Self-Regulatory Supervision of Listed Companies No. 1—Standardized Operation of Companies Listed on the Main Board)," January 7, 2022, http://www.szse.cn/lawrules/rule/stock/main/t20220107_590547.html.

highlight its actions to support the goal of "carbon peak and carbon neutrality"[31].

- For financial institutions:
  - In early 2021, the PBOC began trial implementation of financial institutions' environmental disclosure guidelines, work plans, and operating manuals in the "six provinces and nine places" of green finance pilot zones. As part of this, PBOC required financial institutions to disclose all scope 1, 2, and 3 emissions. Financial institutions in Guizhou, Zhejiang, the Guangdong-Hong Kong-Macao Greater Bay Area, as well as all legal city commercial banks in Jiangxi have successively released disclosure reports. The total number of disclosing financial institutions in pilot zones surpassed 200 by Mar 2022[32].
  - In July 2021, the PBOC officially issued the *Guidelines for financial institutions Environmental Information Disclosure*(*金融机构环境信息披露指南*), rolling financial institutions' environmental and climate disclosure from pilot cities to a wider range-encompass all commercial banks, asset management institutions, trust companies, and insurance companies, but it did not require disclosure for scope 3, i.e., financial institution portfolio carbon emission. The Guideline promotes on a voluntary basis financial institutions' ESG disclosure.

Box 2: Key trends in disclosure policy standards

Positive trends	Other trends
• Increasing relevance and provision of policy signals for disclosure standards across various asset classes from various regulators; • Promoting a unified reporting format for certain corporates	• Overall slow progress in putting forward the mandatory disclosure for all listed companies; • Lack of coherent non-financial disclosure standards; • Lack of enforcement and relevant penalties for lack of disclosures.

[31] 界面新闻, "科创板年报新要求确认：公司需增加 ESG 相关信息披露 (New Requirements for Sci-Tech Innovation Board Annual Report Confirmed: Companies Need to Increase ESG-related Information Disclosure)," January 19, 2022, https://www.163.com/dy/article/GU3EQEK20534A4SC.html.

[32] 中国金融, "提升金融机构环境信息披露能力 (Improving the ability of financial institutions to disclose environmental information)," May 2022, https://finance.sina.com.cn/money/bank/yhpl/2022-05-12/doc-imcwiwst6974348.shtml.

(MEE's new rule on corporate disclosure); • Adding/encouraging aspects of climate-relevant disclosure in the policies.	

Incentive and restraint mechanisms

Incentive and restraint mechanisms for green finance support financial institutions to accelerate the use of green finance and restrain the use of non-green finance. PBOC and CBIRC are leading policy development in this field.

- In June 2021, PBOC officially issued *Green Finance Evaluation Plan for Banking financial institutions (银行业金融机构绿色金融评价方案)*[33], aiming for green finance evaluation of 24 major banking financial institutions. This Plan is an upgrade of the 2018 *Notice on Conducting Green Credit Performance Evaluation of Banking Depository Financial Institutions*: the **new Plan enlarged the green finance product spectrum to include green bonds, and expanded evaluation subjects from larger banking entities such as large commercial banks, joint-stock banks, and policy banks to smaller city commercial banks**. The Plan also supplements to overall green finance statistical system. The Plan was an initial step towards a more comprehensive green finance evaluation and meanwhile improved incentives and constraints policy system.
- In Nov 2022, the CBIRC issued the *Notice on the Statistical System for Green Insurance Business (绿色保险业务统计制度的通知)* to **collect and summarize green insurance data of insurance companies**. According to CBIRC, the next step will be to study and issue relevant guidance on green insurance and establish a sound green insurance policy system. This has partially complemented the overall green finance statistical system.
- PBOC utilized the dual-pillar framework of "macro-prudential policy + monetary policy" to promote the growth of green finance[34]. **Banks are rewarded for their performance on green credit through higher scores** (already since 2017). The practice for the monetary policy aspects allows PBOC to accept green loans and bonds as collateral to grant banks increased access to PBOC's Short-term Standing and Medium-term Lending Facilities (since 2018). 2021 marked important

[33] Jingyun Liu, "PBoC Issues Green Finance Assessment Plan for Banking Institutions," *Seneca ESG* (blog), June 11, 2021, https://www.senecaesg.com/insights/pboc-issues-green-finance-assessment-plan-for-banking-institutions/.

[34] 21 世纪经济报道, "四大绿色金融激励措施将出，宏观审慎政策侧重防范气候风险 (Four major green financial incentives will be launched, and macro-prudential policies will focus on preventing climate risks)," April 20, 2021, https://finance.sina.com.cn/tech/2021-04-20/doc-ikmxzfmk7964944.shtml.

progress in relending instruments of the monetary policy: On Nov 8th, 2021, **PBOC launched a carbon-reduction supporting tool[35] to provide low-cost loans to financial institutions for lending to enterprises in priority carbon-reduction industries**. The PBOC identified 21 policy banks to support and has imposed stringent requirements.

Furthermore, as of the end of Sep 2022, **PBOC supported the use of RMB240 billion (USD 33.8 billion) and more than RMB400 billion (USD 56.3 billion) in total of carbon-reduction supporting finance through the Carbon Emission Reduction Facility (CERF)**. CERF aims to promote carbon reduction and support the development of clean energy and energy conservation and allows financial institutions to provide loans to borrowers, 60% of which will be refinanced by PBOC at 1.75% - less than half of the Loan Prime Rate (LPR). PBOC claims a reduction of more than 80 million tons of carbon emissions[36]. Moreover, PBOC added two foreign lenders, Deutsche Bank (China) Co Ltd and Société Générale (China) Ltd, to the list of financial institutions within the supporting tool in August 2022, illustrating a willingness on China side to further cooperate with foreign financial institutions on green finance development.

Besides the national level, **provincial-level incentive systems have been established through preferential interest rates for green credits and bonds**, green special re-lending through local government or PBOC, and through risk guarantee or compensation funds. For instance, Beijing, Guangzhou[37], Jiangsu[38], Shenzhen[39], Hong Kong, etc. have introduced subsidies for green bonds: Shenzhen offers subsidies of up to RMB500,000 per project per enterprise that successfully issues green bonds in Shenzhen. Meanwhile, the use of re-lending mechanisms to promote green initiatives is prevalent throughout the seven pilot provinces.

Contrary to green incentives, **also incentives for fossil fuel have been expanded**:

- On November 21st, PBOC introduced an RMB 200 billion (USD31 billion) relending program for clean coal[40].

[35] 中国政府网, "人民银行推出碳减排支持工具 (PBOC launches carbon reduction support tool)," November 18, 2021, http://www.gov.cn/xinwen/2021-11/08/content_5649848.htm.

[36] 新浪财经, "易纲：截至今年 9 月末碳减排支持工具累计使用 2400 多亿元 支持碳减排贷款超过 4000 亿元 (Yi Gang: As of the end of September this year, more than RMB 240 billion of CERF have been used, which supported more than RMB 400 billion loans)," November 21, 2022, https://finance.sina.com.cn/china/gncj/2022-11-21/doc-imqmmthc5424081.shtml.

[37] 广州市黄埔区人民政府, "《广州市黄埔区 广州开发区促进绿色金融发展政策措施实施细则（修订）》 (Implementation Rules for Policies and Measures for Promoting Green Finance Development in Huangpu District, Guangzhou City and Guangzhou Development Zone (Revised))," November 2022, http://www.hp.gov.cn/zwgk/zcjd/zcjd/content/post_8673588.html.

[38] 中国政府网，"江苏：发绿色债券贴息 30% 绿色企业上市奖励 200 万元 (Jiangsu: Issuing green bonds with a discount of 30% and rewarding green enterprises with RMB 2 million for listing)," 2019, http://www.gov.cn/xinwen/2019-08/17/content_5421985.htm.

[39] 深圳市政府, "深圳市人民政府关于构建绿色金融体系的实施意见 (Shenzhen Municipal People's Government: Implementation Opinions on Building a Green Financial System)," January 2019, http://www.sz.gov.cn/zwgk/zfxxgk/zfwj/szfwj/content/post_6577287.html.

[40] Bloomberg. China's Coal Support Continues With $31 Billion Finance Promise, 2021.

- In April 2022, the PBOC introduced special products for rediscounting energy supply protection and provided RMB 890 million (about USD 150 million) of note financing support for 10 thermal power enterprises in the first batch.
- A second batch was announced worth RMB 100 billion (about USD 15 billion) "to support the clean and efficient use of coal" in May 2022.[41]

Box 3: Relevant trends in incentive and restraint mechanism

Positive trends	Other trends
• Increased incentive mechanisms for green bond issuance; • Improved incentive mechanism for green lending.	• Increased incentives for fossil-related investments; • Lack of disincentives for brown investments; • Overall insufficient coverage and unclear effect of incentives (i.e., for smaller banks to carry out green finance at city/county level).

Product and market system

In July 2021, PBOC released the standard for Environmental Equity Financing Instruments[42]. The standard clarified the classification and stipulated the overall requirement of environmental equity financing instruments. It also put up the implementation process for current typical environmental equity financing instruments, providing guidance for enterprises and financial institutions to carry out environmental equity financing activities.

In April 2022, the CSRC issued the "**Carbon Financial Products**" standard[43], putting forward normative requirements and providing guidance for the classification and implementation of carbon financial products. This can regulate and enrich trading instruments in China's emission trading system (ETS).

China's **national Emission Trading System (ETS)** was launched in July 2021 after 10 years of piloting. It obliged 2,225 large emitters in the power sector with total annual emissions of close to 4.5 billion tons of CO_2 per year, or around 40% of China's total. ***Allowances are given out for free***.

[41] Xinhua, "China's central bank steps up support for clean, efficient coal use, 2022 http://english.www.gov.cn/statecouncil/ministries/202205/05/content_WS627305b2c6d02e533532a3d2.html

[42] 全国金融标准化技术委员会, "《环境权益融资工具》金融行业标准正式发布 (The financial industry standard of "Environmental Equity Financing Instruments" was officially released)," August 2022, https://www.cfstc.org/jinbiaowei/2929436/2980681/index.html.

[43] 资本市场标准网, "碳金融产品 (Carbon Financial Products)," April 2022, http://www.csisc.cn/zbscbzw/wg61hh/202204/3fc33d5207ee452bbc48c457a8de681c.shtml.

China offers three main types of transactions, whereby only the first two can be traded on the national ETS:

1. carbon spot trading products that contain carbon emission allowance (CEA)
2. carbon spot trading of Chinese Certified Emission Reduction (CCER), and
3. carbon derivative trading products, where CEA makes much of the trade and is supplemented by the other two.

It should be noted that the CCER approval process has been suspended since 2017, and as a beneficial complement to the mandatory market, it is anticipated to be re-initiated soon albeit the exact time is not clear[44]. The city of Beijing announced the establishment of a national voluntary emission reduction trading center in Feb 2022[45] (which may be a positive sign although the actual starting time remains uncertain).

Other derivative instruments such as carbon long-term, carbon futures, carbon periods, carbon options, carbon asset securitization, and indexed carbon trading products are traded at low levels in pilot carbon markets, which are operating in parallel with the national ETS[46]. Pilot local carbon markets have explored different instruments to diversify product types and promote flexibility and liquidity of trading, but they have not become major tools in use yet. There is no public announcement on how these eight local pilots will evolve, i.e., whether or when they might be phased into the national market.

In addition to compliance trading, Shanghai Environment and Energy Exchange released the first corporate carbon credit evaluation standards (CCCES) in June 2022 and announced that they would start the development of the carbon price index. CCCES provides companies with a tool to comprehensively demonstrate their carbon emission reduction capabilities.[47]

Blue carbon credits have seen a rise through the approval of the Hainan International Carbon Emissions Trading Center in March 2022[48]. The Center aims to make blue carbon a globally recognized standard through market-oriented trading of marine carbon sinks (or "blue carbon") products.

In July 2022, **HKEX established the Hong Kong International Carbon Market Committee to lay out the development of a unified carbon market for the Greater Bay area**[49].

[44] 生态环境部, "生态环境部召开 10 月例行新闻发布会 (MEE held a regular press conference in October)," October 27, 2022, https://www.mee.gov.cn/ywdt/zbft/202210/t20221027_998163.shtml.

[45] 京报网, "北京将承建全国自愿减排交易中心，探索与国际碳交易机制接轨 (Beijing will construct a national voluntary emission reduction trading center to explore the integration with the international carbon trading mechanism)," February 2022, https://news.bjd.com.cn/2022/02/16/10043380.shtml.

[46] Chongqing, Fujian, Guangzhou, Wuhan, Shanghai, Tianjin, Shanghai, Shenzhen

[47] China Development Brief, "Carbon Price Index Announced in Shanghai," 25 2022, https://chinadevelopmentbrief.org/reports/carbon-price-index-announced-in-shanghai/.

[48] 海南省人民政府网, "海南国际碳排放权交易中心获批设立 (Hainan International Carbon Emissions Trading Center Approved to Establish)," March 2022, https://www.hainan.gov.cn/hainan/tingju/202203/19eaf1b283004947874d696d1e20fda9.shtml.

[49] 新浪财经, "香港交易所成立香港国际碳市场委员会布局发展碳市场 (HKEX Establishes Hong Kong International Carbon Market Committee to Develop Carbon Market)," July 2022,

Moreover, new products, such as **transition bonds** are intended to supplement existing green bonds and whereby proceeds should go toward companies' green transition projects, such as cleaner coal production, use of natural gas, and application of green technologies. Just as green bonds, transition bonds have requirements on the use of proceeds, disclosure, third-party assessment, certification, etc.

China launched a pilot program for companies to issue transition bonds in June 2022 and required that transition bonds should focus on traditional industries' upgrading and transformation. Companies in eight sectors — electricity, construction materials, steelmaking, nonferrous metals, petrochemicals, chemicals, papermaking, and civil aviation — were allowed issue bonds to help them shift to greener modes of operation, according to the NAFMII[50]. In the meantime, the Shanghai Stock Exchange revised its guideline[51] for corporate bonds, including a new variety of low-carbon transition (linked) corporate bonds, "Belt and Road" corporate bonds, which will further boost the development of transition bonds.

Box 4: Recent trends in product and market

Positive trends	Other trends
• Launch of ETS and increased trading; • Issuance standards of new products for carbon/environmental equity finance; • Launch of transition bonds; • Ideas of linking carbon markets explored.	• Lack of roadmap and timeline for carbon market development; • Lack of market mechanism of the ETS (i.e., to incorporate more diversified carbon products and derivatives); • Continued high share of free allowances on carbon market reducing the efficiency of trading; • Continued existence of parallel pilot carbon markets leads to potential confusion.

https://finance.sina.com.cn/stock/hkstock/hkzmt/2022-07-05/doc-imizmscv0193682.shtml.

[50] National Association of Financial Market Institutional Investors (NAFMII). Notice on Launching Innovation Pilot Programs Related to Transition Bonds (中国银行间市场交易商协会: 关于开展转型债券相关创新试点的通知), 2022, http://www.nafmii.org.cn/ggtz/tz/202206/P020220606608323917589.pdf.

[51] 上海证券交易所, "关于发布《上海证券交易所公司债券发行上市审核规则适用指引第 2 号——特定品种公司债券（2022 年修订）》的通知 (Notice on Issuing the "Shanghai Stock Exchange Guidelines No. 2 for the Applicability of the Review Rules for the Issuance and Listing of Corporate Bonds - Specific Types of Corporate Bonds (Revised in 2022)") " June 2, 2022, http://www.sse.com.cn/lawandrules/sselawsrules/bond/review/c/c_20220602_5703022.shtml.

International Green Finance Cooperation and Standards

China is active internationally to set and shape green finance standards. The PBOC is co-leading the G20 Sustainable Finance Working Group (SFWG), initiated the Network for Greening the Financial System (NGFS), and China collaborates with the EU to lead the International Platform for Sustainable Finance (IPSF) to develop the ***Common Ground Taxonomy*** published in its updated version in June 2022 (first published in 2021)[52]. This Taxonomy was developed based on the EU and China's past work on taxonomy, with the purpose of building greater comparability and interoperability among different national taxonomies to support common or converging practices of financial institutions and companies on green activities. This is essential in promoting domestic and overseas market recognition of China's green financial products, reducing certification costs, and attracting more international investors.

China has also worked with the United States on transition finance. In Nov 2022, the two parties jointly issued the "G20 Transformational Finance Framework", to guide G20 members to formulate specific policies for transition finance, including the introduction of transitional finance standards, information disclosure requirements, incentive mechanisms, etc.

Furthermore, **China has been actively supporting the work of the International Sustainability Standards Board (ISSB)** which was founded and oversight by the International Financial Reporting Standard (IFRS), e.g., one of the four members of the new inaugural members of the ISSB is Leng Bing, director of the Accounting Regulatory Department of the Ministry of Finance (MOF). ISSB's most influential work will be to initiate a global baseline framework for non-financial sustainability disclosure, and this is a "must do" to build an accessible, traceable, verifiable green finance working system. And once implemented, it will impact disclosure behavior, especially for China's overseas listed companies.

As a major international financier, e.g., through its Belt and Road Initiative (BRI), China supports overseas green finance standard setting, for example through the Green Development Guidance with the Traffic Light System[53], the Green Investment Principles (GIP)[54], in addition to several green finances and green cooperation government-issued documents[55]. By September 2022, 44 financial institutions across 17 countries (within USD41 trillion assets under management) have joined the Principles, which are the most important stakeholders to drive works and leverage funds for the Belt and Road.

In its policy guidelines, China has moved towards recommending international green finance standards in lieu of host country rules for overseas projects and finance in

[52] In September 2022, Trina Solar became the world's first green syndicated debtor (commercial loan) under the Common Ground Taxonomy (https://www.trinasolar.com/cn/resources/newsroom/mon-09262022-1536)

[53] Nedopil, C. et al. Green Development Guidance for BRI Projects Baseline Study Report, 2020.

[54] Green Finance Leadership Program. Green Investment Principles (GIP) for the Belt and Road, 2018.

[55] Nedopil, C. Green finance for soft power: An analysis of China's green policy signals and investments in the Belt and Road Initiative. Environ. Policy Gov. eet.1965 (2021) doi:10.1002/eet.1965.

countries with weak environmental laws, for example through the CBIRC *Green Finance Guidelines for Banking and Insurance Industry and the Opinions on the Joint Implementation of Green Development in the Belt and Road Initiative (2022) (see* Figure 4*)*. At the core of this new Opinion is the requirement to advance green development throughout BRI cooperation.

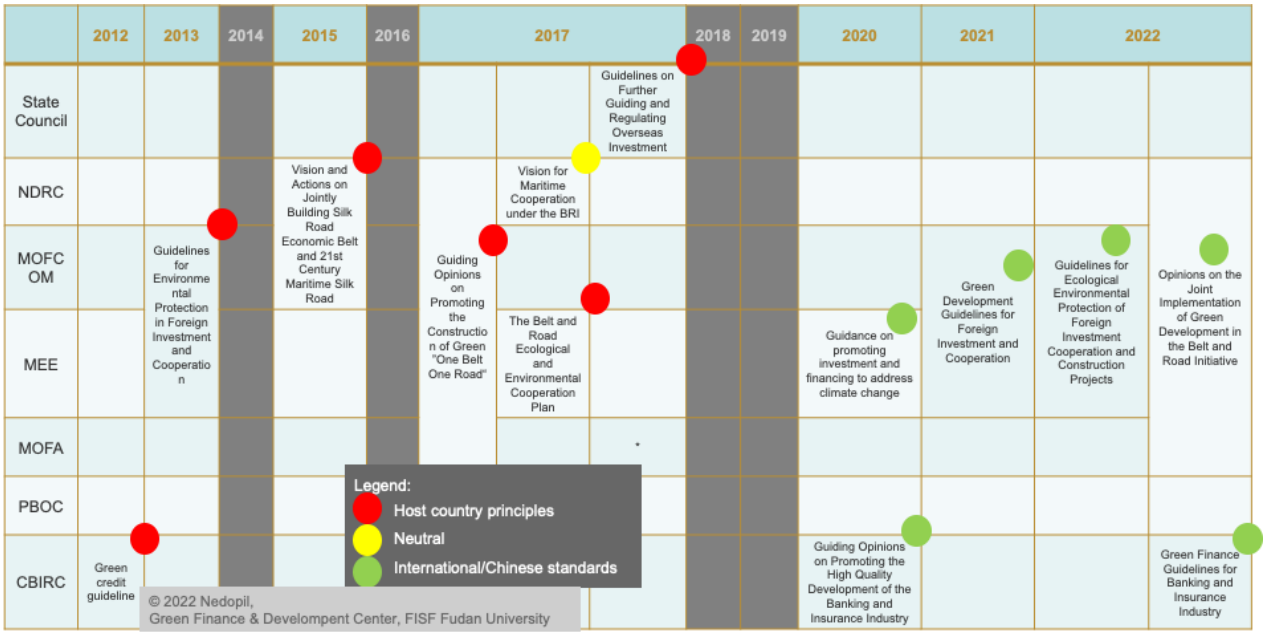


Figure 4: China's overseas green finance policy development (Source: Author)

Additionally, as a member of the Shanghai Cooperation Organization (SCO), China supported a joint statement on climate change response in September 2022, that included aspects of experience exchange on investment criteria and sustainable projects including green classification, studying the prospect of deepening cooperation in the field of fund raising to prevent and adapt to climate change, conducting dialogues on carbon markets among SCO member states which includes dialogues on entering and participating in international carbon markets.[56]

Box 5: Trends in international green finance

Positive trends	Other trends
• Strong participation of China in international regulatory green finance institutions (e.g., IPFS, ISSB, G20);	• Low levels of participation of Chinese financial institutions in voluntary international associations and standard setters (e.g., GFANZ, PRI);

[56] 上海合作组织成员国元首理事会关于应对气候变化的声明 (Statement of the Council of Heads of State of the Shanghai Cooperation Organization on Addressing Climate Change), Sep 2022, http://eng.sectsco.org/load/914639/

• Strong policy support for green finance in the BRI through both regulatory and voluntary standards (e.g., BRIGC, GIP); • Recommendations for Chinese financial institutions and developers in international projects to apply international project finance standards.	• Continued support for multiple fossil finance projects (e.g., gas, oil), versus no new coal.

3. Green Finance application through green finance instruments

China has multiple green financial instruments, dominated by green credit and green bonds. The following section analyzes the development of these green finance instruments focusing on

- Green credit
- Green bond
- Sustainability linked bonds
- Green funds
- ESG investments
- Transition finance and transition bonds
- Green index
- Green insurance
- Carbon finance and emission trading
- Biodiversity finance

Green credit

Green credit is the earliest, largest, and most mature green instrument in China. By the end of the third quarter of 2022, the total green loan balance in the domestic and foreign currencies of China was RMB 20.9 trillion (about USD 3 trillion)[57], an increase of about 31% compared to the previous year[58]. Green loans constitute about 10% of China's total loan market (see

Figure 5).

The development has been made possible due to China's bank-dominated structure with strict state control that has continued to help China's mobilization of capital for top-down goals (e.g., recovery during the COVID-19 pandemic). To what extend the traditional bank-dominated and the highly regulated system is suitable for a growth model that needs shifting from mobilizing inputs to relying on innovation, including for a green transition, is under discussion.[59] The

[57] 中国人民银行, 2022 年三季度金融机构贷款投向统计报告 (Statistical Report on Loan Direction of Financial Institutions in the Third Quarter of 2022), October 28, 2022, http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4692500/index.html.

[58] 21 世纪经济报道, "三季度绿色贷款余额超 20 万亿 五家大行绿色贷款增幅亮眼 (The balance of green loans in the third quarter exceeded RMB 20 trillion, and considerable growth of green loans by five major banks)," October 2022, https://m.21jingji.com/article/20221029/herald/1cb2ae1ffda8019a2d62477765b55d05.html.

[59] Yiping Huang and Tinging Ge, "Assessing China's Financial Reform: Changing Roles of the Repressive Financial Policies," Cato Journal, February 25, 2019, https://www.cato.org/cato-journal/winter-2019/assessing-chinas-financial-reform-changing-roles-repressive-financial.

Chinese authorities have realized this problem and recognized the importance of developing a "multi-layered capital market", and providing more diverse financing channels for market players. The decision-makers are also promoting "supply-side reform"[60], which highlights the role of the market in resource reallocation. The regulator claims that the green credit of the 21 major banks can save more than 400 million tons of standard coal and reduce carbon dioxide equivalent by more than 700 million tons each year[61].

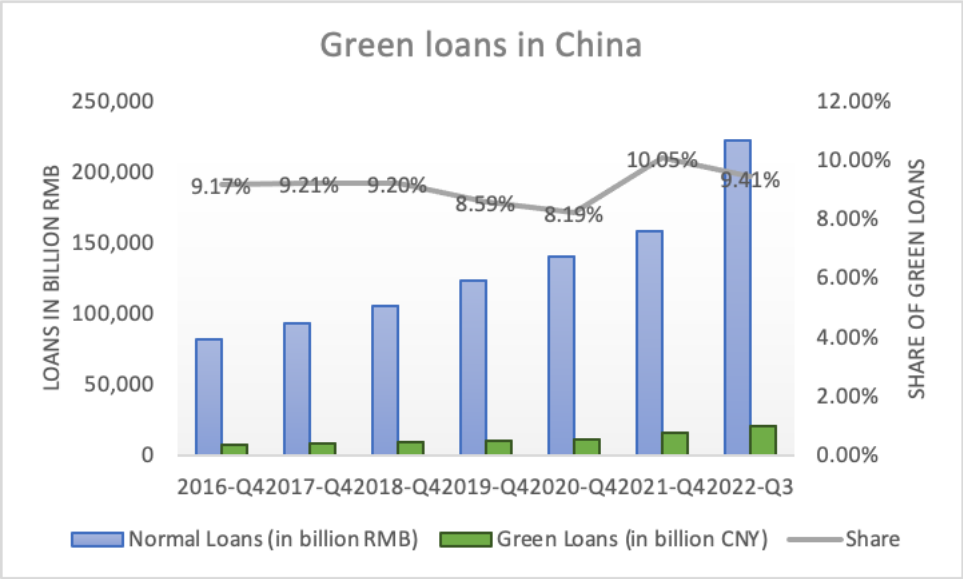


Figure 5: Loans and green loans in China (Data: CBIRC, PBOC, Figure: Author)

Particularly the June 2022 Green Finance Guidelines issued by CBIRC have the potential to bring green lending into the core of banks. It stipulates that banks would gradually and orderly reduce the carbon intensity of the asset portfolio, and finally achieve carbon neutrality of the asset portfolio.[62]

Green bond

Within six years (after China launched its green bond market in 2016), China has built one of the world's largest green bond markets, with a continuously growing trend in 2022. By November 23rd, 2022, the issuance scale of green bonds reached RMB744.6 billion (USD 106 billion), with a year-on-year increase of 46.5%, exceeding that of the entire 2021. And the number of issuances was 590, an increase of 13.7%

[60] Bank of China, "金融供给侧结构性改革的背景、内涵及影响 (The Background, Connotation and Impact of Financial Supply-Side Structural Reform and Impact)", April 22, 2019, https://pic.bankofchina.com/bocappd/rareport/201904/P020190424383785607033.pdf.

[61] Ibid.

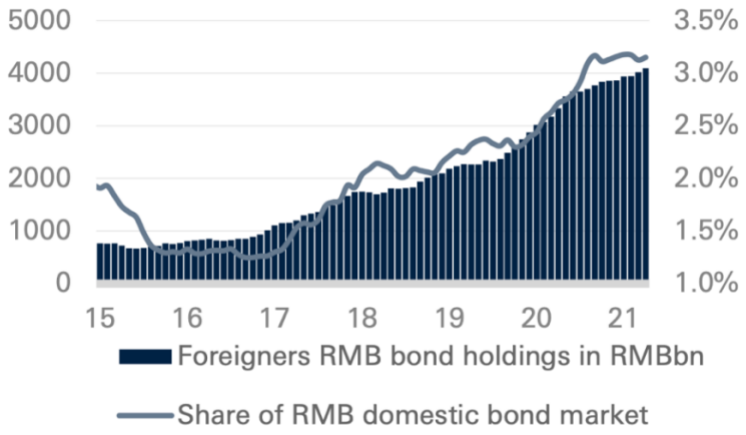
[62] 中国银保监会, "关于印发银行业保险业绿色金融指引的通知 (Notice on Issuing the Green Finance Guidelines for the Banking and Insurance Industry)," June 2022, http://www.gov.cn/zhengce/zhengceku/2022-06/03/content_5693849.htm.

over the same period of the previous year[63]. Despite the current rapid expansion of green bond issuance, the proportion of labeled green bonds in China's overall bond market is still limited, less than 2%[64], and there is still space for growth.

The development of China's green bond market so far can be distinguished into two major phases: the early phase with issuances dominated by financial institutions and the current phase with mixed issuance by financial and commercial institutions. Issuances are dominated by state-owned enterprises (including financial and non-financial enterprises), which accounted for 97% of domestic green bonds issued in terms of the number of green bonds issued, and close to 99% in terms of issuance amount.

The majority (88.3%) of funds raised in China's green bond market were invested in renewable energy, low-carbon transport, and low-carbon buildings.

Foreign participation in the bond (and green bond) market in China remains low at 3.2% in China's bond market (see Figure 6)[65, 66] due to low liquidity and market barriers. In November 2022, OCBC Wing Hang Bank Co., Ltd. successfully issued a green financial bond with a total scale of RMB 500 million. This was the first green financial bond issued by a foreign bank in the Chinese domestic market[67].



[63] 中国新闻网, "我国年内已发行绿债 7445 亿元 规模超去年全年 (China has issued green bonds of RMB 744.5 billion this year, exceeding the scale of last year)," November 24, 2022, https://chinanews.com.cn/cj/2022/11-24/9901050.shtml.
[64] 中国社会科学院经济研究所等, 中国上市公司蓝皮书 中国上市公司发展报告（2022）(Blue Book of Chinese Listed Companies: Development Report of Chinese Listed Companies), November 23, 2022, http://ie.cass.cn/academics/academic_activities/202211/t20221123_5566122.html.
[65] NATIXIS Corporate & Investment Banking, "China Faces More Challenges in Attracting Securities Investment," March 31, 2022, https://research.natixis.com/Site/en/publication/IChakZU58MbfNJW8jmuMlA%3D%3D?from=share.
[66] Evelyn Cheng, "Overseas Investors Are Snapping up Mainland Chinese Bonds," CNBC, May 21, 2021, https://www.cnbc.com/2021/05/21/overseas-investors-buy-up-mainland-chinese-bonds-in-a-search-for-yield.html.
[67] 和讯网, "华侨永亨银行发行境内首单外资银行绿色金融债 (OCBC Wing Hang Bank issued the first green financial bond of a foreign bank in China)," accessed November 16, 2022, http://bank.hexun.com/2022-11-17/207115737.html.

Figure 6: Foreign holdings of the Chinese Bond Market. (Source: Deutsche Bank)

In Sep 2022, after putting forward China's green bond principles in July 2021, **the Green Bond Standards Committee designated 18 agencies as China's first batch of officially approved green bond evaluation and certification institutions**[68]. The goal is to expand independent, professional, and market-reputable third-party institutions to help the market better identify green economic activities and regulate the conduct of assessment and certification bodies.

Green funds

Green funds play an important role in China to provide access to equity finance for select green industries.

In 2020, China established National Green Development Fund, with a capitalization of RMB 88 billion (USD 14 billion) to provide equity financing in support of decarbonization. Also, provinces set up green development funds or environmental protection funds, including Beijing set up a green infrastructure investment fund with RMB4.5 billion[69], Shandong established a green climate fund with a total scale of RMB10 billion[70], Liaoning aimed at environmental protection areas and arranged RMB 3 billion funds for it, and Zhejiang put up RMB 6 billion to support various green industries development such as environmental protection and rural revitalization.[71]

According to the Asset Management Association of China, there are 1,178 public and private equity funds with green and sustainable ESG investment directions, with a total scale of RMB 882 billion, an increase of 34% compared with 2020. Among them, there are 242 public funds with a management scale of more than RMB442 billion, and 936 private equity funds with a management scale of more than RMB400 billion. Equity venture capital funds account for more than 90% of them[72]. Also, traditional fossil or heavy-emitting enterprises set up such funds. In Nov 2022, the Aluminum Corporation of China joined hands with the Agricultural Bank of China to invest and set up an RMB 6 billion green low-carbon private equity fund[73].

---

[68] 中国经济网, "18 家机构通过绿标委注册——绿色债券市场强化行业自律 (18 institutions have passed the registration of the Green Standard Committee - the green bond market strengthens industry self-discipline)," September 2022, http://www.ce.cn/xwzx/gnsz/gdxw/202209/29/t20220929_38134392.shtml.

[69] "首期规模 45 亿！北京绿色基础设施投资基金成功设立 (The scale of the first phase is 4.5 billion! Beijing Green Infrastructure Investment Fund was successfully established)," December 31, 2021, https://www.chinalifeinvest.com/html1/report/22011/6-1.htm.

[70] 中国政府网, "首笔绿色气候基金花落山东 (The first green climate fund was awarded to Shandong)," December 2019, http://www.gov.cn/xinwen/2019-12/12/content_5460516.htm.

[71] 中央财经大学绿色金融国际研究院, "2020 年绿色基金市场进展及相关建议 (2020 Green Fund Market Progress and Related Suggestions)," May 2021, https://www.hbzhan.com/news/detail/141663.html.

[72] 21 世纪经济报道, "ESG 投资基金规模 8821 亿元，'双碳'转型构建生态权益价值实现机制 (The scale of ESG investment funds is RMB 882.1 billion, and the transformation of "dual carbon" builds a mechanism for realizing the value of ecological rights and interests)," November 28, 2022, http://www.21jingji.com/article/20221128/herald/5a75ff0b4f921b4a703de0bd37f3055a.html.

[73] 新浪网, "中铝绿色低碳基金完成备案 (Green and Low Carbon Fund of Aluminum Corporation of China completed the filing)," November 2022, https://finance.sina.com.cn/tech/roll/2022-11-11/doc-imqmmthc4190892.shtml.

ESG investment

Chinese ESG fund launches surged in 2021, as China announced its carbon neutrality goal. By June 2022, the total scale of public and private equity funds with green and sustainable ESG orientation was RMB 882 billion (USD 126 billion) distributed over 1178 funds[74]. While the number of ESG funds had grown, over the past years, 2022 saw a slowdown with only 89 new funds issued in 2022[75]. Meanwhile, assets managed in ESG funds in China were about USD48.8 billion by the first quarter of 2022, which was a 14% decrease compared to the previous year. This was due to a market downturn, as well as a 95% reduction of net inflows into China's sustainability-themed funds from USD4.1 billion in the fourth quarter of 2021 to USD$214.9 million in the first quarter of 2022.[76]

Of more than 170 ESG funds domiciled in China, about 15% are invested in coal companies, by far the biggest source of GHG emissions in China. And more than 60% have holdings in the steel industry, a massive consumer of coal[77].

Overall, similar to bonds, foreign participation in the Chinese stock markets are low at 4.2%. To expand the market, the NDRC released the *Several Policy Measures to Stabilize Foreign Investment Stocks and Spur Foreign Investment Quality and Quantity* in October 2022, with the goal to guide foreign investment to actively participate in carbon peaking and carbon neutrality, and equally participate in the formulation and revision of relevant standards in the green and low-carbon field.[78]

Sustainability-linked bonds and loans

In April 2021, China's National Association of Financial Market Institutional Investors (NAFMII), a self-regulatory body of China's interbank bond market under the central bank, first introduced sustainability-linked bonds (SLB) and drafted the regulations[79] based on Sustainability-Linked Bond Principles (SLBP) issued by International Capital Market Association (ICMA)[80]. In May 2021, China issued its first batch of SLB by seven issuers including China Huaneng Group Co., Ltd. The amount was RMB 7.3

[74] 21 世纪经济报道, "ESG 投资基金规模 8821 亿元，'双碳'转型构建生态权益价值实现机制 (The scale of ESG investment funds is RMB 882.1 billion, and the transformation of "dual carbon" builds a mechanism for realizing the value of ecological rights and interests)," November 28, 2022, http://www.21jingji.com/article/20221128/herald/5a75ff0b4f921b4a703de0bd37f3055a.html.

[75] 中信证券，2023 年 ESG 投资策略：立足中国市场，聚焦实体投资，创新企业服务(ESG investment strategy for 2023: Based on the Chinese market, focus on physical investment, and innovate corporate services), Nov 2022.

[76] Martin Choi, "ESG Inflows Take a Hit in China as Investors Turn Pessimistic: Morningstar," South China Morning Post, May 2022, https://www.scmp.com/business/china-business/article/3177395/investors-shun-chinese-esg-funds-first-quarter-markets-take.

[77] Ibid.

[78] 中国政府网, "国家发展改革委等部门印发《关于以制造业为重点促进外资扩增量稳存量提质量的若干政策措施》的通知 (NDRC et al, Several Policies and Measures Concerning Promoting Foreign Capital Expansion, Stabilization, and Quality Improvement by Focusing on the Manufacturing Industry)," Oct 2022, http://www.gov.cn/zhengce/zhengceku/2022-10/25/content_5721563.htm.

[79] 中国银行市场间交易商协会, "交易商协会推出可持续发展挂钩债券 (NAFMII Launches Sustainability-Linked Bonds)," April 2021, http://www.nafmii.org.cn/xhdt/202104/t20210428_197371.html.

[80] ICMA, "Sustainability-Linked Bond Principles (SLBP)," accessed November 15, 2022, https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/sustainability-linked-bond-principles-slbp/.

billion. The coupon rate was preferential compared to vanilla bonds.[81]

In August 2022, the regional lender Shanghai Pudong Development Bank (SPDB) underwrote the first issue of carbon asset bonds. The "22 Anhui Energy SCP004 Carbon Asset" raised RMB 1 billion for Anhui Province Energy Group Company Limited with a floating rate component pegged to carbon emissions abatement returns, and a fixed rate component of 1.8%.[82]

Transition finance and transition bonds

By the first half year of 2022, 23 transition bonds were issued from 17 issuers globally, worth USD 2.1 billion. All but one of them are first-time issuers under the transition label, and they were mainly dominated by China and Japan's steel, chemical, electricity, etc. high emission sectors[83].

Green index

According to the data of China Securities Index Company, by the end of Q3 2022, the scale of domestic green index investment funds exceeded RMB 130 billion, an increase of 16% compared to the same period last year. Green index investment funds with themes such as clean energy and green transportation dominate[84].

The first carbon-neutral exchange-traded funds (ETF) (CSI-SEEE Carbon Neutral ETFs) were launched in April 2022 and listed in Shanghai and Shenzhen Stock Exchanges respectively. The eight ETFs in this offering were all based on the CSI-SEEE Carbon Neutral Index developed by Shanghai Environment and Energy Exchange.[85]

Later, in August 2022, the Bank of China (HK) and S^P Dow Jones indices launched the first climate transition index targeting the greater bay area with the goal to reorient capital flows toward low-carbon companies.[86]

Green insurance

Green insurance in China mainly focuses on environmental pollution liability insurance. Other innovations in green insurance, such as the public area environmental pollution cleanup expense insurance and green building have also been explored. Yet the size of green insurance is comparably small within the insurance industry. In 2020, the insured amount of green insurance reached

---

[81] 中国货币市场, "可持续发展挂钩债券的发展现状与政策建议 (Development Status and Policy Suggestions of Sustainable Development Linked Bonds)," accessed November 14, 2022, https://cj.sina.com.cn/articles/view/6314832590/http%3A%2F%2Fcj.sina.com.cn%2Farticles%2Fview%2F6314832590%2F17864b2ce0010117qt.

[82] China Banking News, "Shanghai Pudong Development Bank Underwrites China's First 'Carbon Asset' Bonds," August 9, 2022, https://www.chinabankingnews.com/2022/08/09/shanghai-pudong-development-bank-underwrites-chinas-first-carbon-asset-bonds/.

[83] CBI, Sustainable Debt Market Summary H1 2022, Aug 2022, https://www.climatebonds.net/files/reports/cbi_susdebtsum_h1_2022_02c.pdf

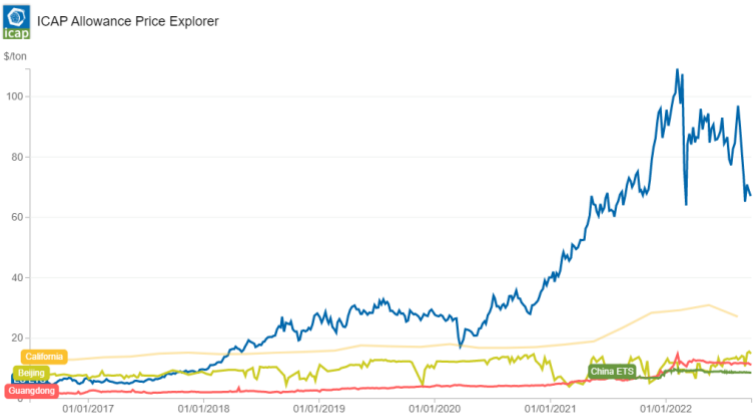
[84] 中国清洁发展机制基金, "绿色指数化投资基金规模超1300 亿元 同比增长 16% (The scale of green index investment funds exceeded RMB 130 billion, a year-on-year increase of 16%)," October 2022, https://www.cdmfund.org/index.php/31830.html.

[85] Yahoo, "China's First Carbon Neutrality ETFs Raise More than US$1.9 Billion as Appetite Grows for Sustainable Investing," July 2022, https://www.yahoo.com/now/chinas-first-carbon-neutrality-etfs-093000244.html.

[86] 标普道琼斯指数, "中银香港携手标普道琼斯指数推出首个聚焦粤港澳大湾区的气候转型指数 (BOCHK and S&P Dow Jones Indices launched the first climate transition index focusing on the Guangdong-Hong Kong-Macao Greater Bay Area)," July 2022, https://www.spglobal.com/spdji/zh/index-launches/article/bochk-and-sp-dow-jones-indices-launches-the-first-climate-transition-index-targeting-the-greater-bay-area/.

RMB18.3 trillion, with a year-on-year increase of 24.9%. And this is the latest update from the Insurance Association of China. No further data were released for 2021 or 2022, with improvements possible based on the statistical guideline released in 2022.

In 2022, the average monthly trading volume of the national ETS was about 1.94 million tons, with the daily closing price between RMB 56 to RMB 62 per ton[88], slightly higher than that of 2021. By the end of November 2022, the cumulative trading volume of carbon emission quotas in the national ETS exceeded 200 million tons, with a turnover of RMB 8.8 billion. More than half of the key emission units participated in transactions[89]. Meanwhile, there was still an obvious trading cycle in the market - the trading volume and transaction value tend to increase when the compliance period is approaching[90].



Carbon finance and emission trading

During the first compliance circle of China's national ETS (by the end of 2021), the cumulative transaction volume of carbon emission allowances was 179 million tons, the cumulative transaction value was 7.661 billion yuan, the average transaction price was 42.85 yuan/ton, and the monthly price was between 40-60 yuan/ton. The compliance rate is at 99.5%, according to MEE. 32.73 million tons of CCERs (registered before the 2017 CCER suspension) have been used to offset emissions. The overall transaction price has not fluctuated significantly[87].

China's carbon price has been lower than the EU (see Figure 7). According to *China Carbon Price Survey Report*, as other high-emission industries such as steel, construction material, etc. might enter the market, the average carbon price could rise

[87] "生态环境部发布《全国碳排放权交易市场第一个履约周期报告》(MEE released 'National ETS first compliance circle' report)," January 1, 2023, https://www.mee.gov.cn/ywdt/xwfb/202301/t20230101_1009228.shtml.

[88] 生态中国网, "全国碳市场成交量突破 2 亿吨大关 专家预计我国碳价将逐步走高 (The transaction volume of the national carbon market has exceeded 200 million tons. Experts predict that the carbon price will gradually rise)," November 28, 2022, https://www.eco.gov.cn/news_info/60191.html.

[89] Ibid.

[90] Ibid.

to RMB 87 per ton by 2025, and RMB 139 per ton by 2030[91].

Figure 7: Carbon prices (USD/ton) in EU, California, China national, and Beijing and Guangdong Pilots (Source: ICAP)

Biodiversity Finance

Biodiversity finance has gained momentum, partly due to China's hosting of the biodiversity COP15. Yet, in 2022, biodiversity finance remains in its infancy with few or no Chinese financial institutions participating in the development of international standards, such as TNFD.

A driver might be that ecological conservation is seen as a role of the government (either through public finance or regulation) rather than market mechanisms.

Nevertheless, some developments can be noted: In Apr 2021, the General Office of the State Council issued *Opinions on Establishing and Improving the Value Realization Mechanism of Ecological Products(关于建立健全生态产品价值实现机制的意见)*, emphasized the development of ecological value accounting, and promoted its applications in business development financing, environmental resource rights and interests' transactions, and so on. During the "13th Five-Year Plan" period (2016-2020), the central government arranges an annual amount of nearly RMB200 billion for various types of ecological protection compensation funds[92].

In October 2021, during CBD COP15, 60 banking financial institutions (36 Chinese, 24 foreign) jointly issued a declaration to support biodiversity conservation[93] by developing relevant investment mechanisms. Meanwhile, China also established the Kunming Biodiversity Fund (RMB 1.5 billion). In November 2022, the Bank of China successfully issued the world's first biodiversity-themed green bond on an RMB 1.8 billion equivalent scale[94].

In February 2022, the Green Finance Committee (GFC) initiated the "Financial Support for Biodiversity Research Group", which included i.a., the development of a biodiversity green bond catalog. In November 2022, the research results were published[95].

In August 2022, the Industrial Bank became the **first Chinese bank to develop a**

[91] IFC, 中创碳投, "中国碳价调查报告 (China Carbon Price Survey Report)," February 2022, https://finance.sina.com.cn/esg/investment/2022-02-24/doc-imcwipih5030603.shtml.

[92] 国家发展和改革委员会, "国家发展改革委新闻发布会介绍生态文明建设有关工作情况 (National Development and Reform Commission: press conference to introduces the work related to the construction of ecological civilization)," September 21, 2022, https://www.ndrc.gov.cn/xwdt/wszb/stwmjsyggzqk/?code=&state=123.

[93] 生态中国网, "《银行业金融机构支持生物多样性保护共同宣示》发布 ("Joint Declaration of Banking Financial Institutions Supporting Biodiversity Conservation" Released)," October 25, 2021, https://www.eco.gov.cn/news_info/50155.html.

[94] 中国银行, "中行成功发行全球金融机构首笔生物多样性绿色债券 (Bank of China successfully issued the first biodiversity green bond of a global financial institution)," September 29, 2021, https://www.boc.cn/aboutboc/bi1/202109/t20210930_20119935.html.

[95] 中国金融学会绿色金融专业委员会, "绿金委金融支持生物多样性保护研究组成果发布 (Green Finance Committee Financial Support Biodiversity Conservation Research Group Releases Results)," November 12, 2022, http://greenfinance.org.cn/displaynews.php?id=3920.

biodiversity financial plan[96] while the **Bank of Qingdao developed a Blue Finance programme** together with ADB and IFC (which provided technical support and USD150 million in a syndicated loan)[97].

Furthermore, **several pilots have been established to support Gross Ecosystem Product (GEP)** evaluations, including in Shenzhen, Beijing, Pu'er, and Hainan. GEP is based on an expansive catalogue of indicators and tools for measurement, which include material ecosystem services (e.g., food, water), regulating services (e.g., water retention, water quality improvement), and cultural services (e.g., recreation, tourism).[98]

4. Trends in green finance in China

In 2022 and likely in 2023, China's focus will lie on economic growth to offset significant risks in the aftermath of COVID-related lockdowns, real estate challenges, and geopolitical shifts and risks. China's ambition for technological self-reliance is poised to accelerate investments in high-technology products and technologies, some of which are in the green economy space (e.g., new energy vehicles, and renewable energy). At the same time, China's economic policy risks further investments in fossil fuels supposedly to ensure energy security. Furthermore, China's ambitions seem to point to strategic collaboration with aligned countries, e.g., in the Belt and Road Initiative, and strategic dependence and independence from non-aligned countries, for example, in trade, investments, and finance.

In this larger picture, specific areas of green finance that seem to gain prominence based on an analysis of recent speeches by leading policy makers and think tanks include:

1. **Transition finance is likely to become China's priority in developing green finance.** During the Fifth Hongqiao International Economic Forum, vice governor Xuan Changneng emphasized "steady transformation of high-carbon industries such as coal and low-carbon transition is also an important part of achieving carbon neutrality. Some carbon-intensified industries cannot obtain the funds needed for the transition from the existing green financial system as they do not belong to the green category ". Xuan further stated that in the future, the People's Bank of China will improve the effective connection between green finance and transition finance and apply successful practices and experiences of green finance to support transition activities.[99]. With the

[96] 兴业银行, "绿色金融再创先！兴业银行首家推出生物多样性保护金融方案 (Industrial Bank is the first to launch a financial plan for biodiversity protection)," August 2022, https://www.cib.com.cn/cn/aboutCIB/about/news/2022/20220811.html.

[97] Asian Development Bank (ADB), "Bank of Qingdao Blue Finance Project: Report and Recommendation of the President," Text, Asian Development Bank (ADB), January 31, 2022, China, People's Republic of, https://www.adb.org/projects/documents/prc-55246-001-rrp.

[98] Shenzhen Government online, "City Unveils GEP System for Sustained Development_Latest News-Shenzhen Government Online," March 24, 2021, http://www.sz.gov.cn/en_szgov/news/latest/content/post_8645665.html.

[99] 中国金融学会绿色金融专业委员会, "人民银行副行长宣昌能：进一步做好绿色金融与转型金融的有效衔接

uncertainty of economic development and energy security, China emphasizes energy security as a top priority. In this regard, transition finance can be an important funding source to support transitioning current carbon-intensified sector transit to green. The Green Finance Committee of China will actively explore a transition catalogue.

2. **Disclosure requirements and corresponding supervision are likely to be marked in China's future work to expand its green finance market and attract global investors**. In an interview in June 2022, Yi Gang, governor of PBOC, raised concern about "moral hazards" and warned against "greenwashing, low-cost fund arbitrage, and green project fraud"[100]. The central bank also released an English version of Yi 's comments, a signal of appeal to international audiences.
3. **International cooperation on green finance.** Multiple speeches delivered by policymakers emphasized China's continuing effort in international green finance cooperation. GFC will support the wider application of the Common Taxonomy, both domestically and internationally, and aims to expand the influence of Green Investment Principles (GIP) over the Belt and Road area (GIP established its first African branch during COP27 and will also prepare for the GIP Southeast Asia branch). China will also continue to support the sustainable finance work with G20, the ISSB for ESG standards, and the IPFS.

(Xuan Changneng, Deputy Governor of the PBOC: Further improve the effective connection between green finance and transition finance)," November 2022, http://greenfinance.org.cn/displaynews.php?id=3907.

[100] 中国经济网, "易纲重磅发声 货币政策将继续从总量上发力 (Yi Gang made a big statement that monetary policy will continue to exert force from the aggregate)," June 28, 2022, http://finance.ce.cn/bank12/scroll/202206/28/t20220628_37808554.shtml.

5. Barriers and Recommendations to accelerate green finance in China

5.1 Barriers for green finance in China

China's regulators and related government bodies have provided innovative and ambitious guidelines, guidance, opinions, as well as tools to accelerate green finance applications. This has provided an impetus for the application of various green financial instruments (e.g., bonds, credit), ESG disclosure, and risk management. Financial sector players have picked up on these policy signals and improved environmental (and social) disclosure practices. Overall, while the absolute development of green finance, particularly through bonds and loans, seems large, the green proportion of the system is growing only slowly from very low levels. To "green" the financial system, the proportion of green finance needs to expand significantly faster.

Thus, considering the overall policy activity in green finance, the application of green finance does not adequately reflect the ambition, as witnessed e.g., by the stagnating share of green finance for green loans and bonds in the overall system and the continued financing of non-green assets.

Several reasons can explain the dichotomy between signal and action.

1. **Lacking incentives for green over brown finance**. While China's latest green bond catalogue (2021) removed coal-fired power plants, it still includes upgrading coal-burning industrial boilers in the 'energy efficiency' category and thus expands lifecycles. In addition, **financial incentives for brown assets have partly expanded,** for example in November 2021, PBOC installed an RMB 200 billion (USD31 billion) relending program for clean coal. In May 2022, another RMB 100 billion (about USD15 billion) of relending program was issued "to support the clean and efficient use of coal".[101] According to PBOC, the additional re-lending quota will be used to support the development and use of coal, and enhance the coal reserve capacity, with priority given to ensuring the safe production and storage of coal and ramping up the electricity coal supply for coal-fired power companies.
2. **Overlap of competencies between various ministries' responsibilities and between the central and local governments may lead to overlapping standards and practices**. An example is the development work of green finance led by PBOC, while MEE is responsible for climate finance and SASAC leads green finance development for state-owned enterprises (SOEs). Similarly, emission trading is overseen by both the market regulator CSRC and the MEE. Such overlaps and thus uncertainty exist in different provinces that apply different standards of green finance (e.g., Shenzhen's green finance regulation is more advanced than that of other provinces and first-tier cities). It may

[101] Xinhua, "China's Central Bank Steps up Support for Clean, Efficient Coal Use", May 2022.

lead to "supervisory duplication" or "regulatory gap".

3. **Green finance as a share of the total markets remains low** and an unbalanced structure **exists in green financial products**. Green credit and bonds are the main drivers of the current green finance market, while other instruments have a positive momentum but are relatively weakly developed, particularly for transition finance tools. The existing supporting measures are insufficient to incentivize progress for both green/low carbon and transition investment. For example, while the PBOC's MPA measures are innovative and ambitious, the influence of banks' greenness and the interest rates on their reserves is still marginal.
4. **Green financial instruments need expansion**: For example, a standard for carbon-neutral bonds has not been developed yet, and it is important as China is promoting carbon sinks and ecological product value realization, etc. as key measures/investment areas to offset emissions. Transition finance – as important as it is – should have an accelerated pathway requirement to net zero.
5. **Lack of enabling and robust disclosure standards.** Although domestic market regulators have explained the environmental disclosure requirements of various green finance instruments, there is a lack of framework and operable disclosure guidelines (e.g., for green bonds). Meanwhile, the monitoring, reporting, and verification (MRV) systems and standards are not robust enough to track the accurate use and impact of the funds. According to CBI, "any issuers often use conceptual, institutional, and general expressions when disclosing green-related information, which conveys limited substantive information and makes it difficult for investors to make objective and accurate judgments. Current information disclosure is insufficient"[102]. Climate Bonds' data shows that the proportion of green bonds issued in the past two years with pre-release third-party assessment and certification has decreased, which means the proportion of green bonds with insufficient disclosure is on the rise. **Furthermore, Chinese reporting standards might not be harmonized internationally,** (e.g., with the EU's Sustainable Finance Disclosure Regulation).
6. **Lack of oversight and punishment**. While MEE is publicly shaming companies for falsifying reports (e.g., as in the emission data), overall oversight capacity remains low. Similarly, violations are punished lightly, e.g., failing to provide ESG reports has fines of 100,000 (about USD15.500)[103].

[102] Long, A., Wu, V., Xu, X. & Xie, W. China's Green Finance Policy, 2021, https://www.climatebonds.net/files/reports/policy_analysis_report_2021_en_final.pdf.

[103] 生态环境部, "企业环境信息依法披露管理办法-第五章 罚则 (Measures for the Administration of the Lawful Disclosure of Enterprise Environmental Information - Chapter V Penalties)," December 2021,

7. **Lack of capacity and incentives within financial institutions**, where capacity building is predominantly driven by top-down implementation guidance, while participation in international standards setters and related bodies (e.g., GFANZ, Equator Principles, PRI) is little. This makes ESG risk management often more of a box-ticking exercise that might include annual sustainability reports, rather than an integration of ESG risk evaluation and risk management. At the same time, financial institutions do not provide sufficient incentives for relevant staff to reward the reduction of ecological risks and improvement of green finance.
8. **Internationalization of Chinese green finance remains low**, both regarding international investors being invested in green finance in China's domestic market (which potentially reduces pressure on applying international standards and non-financial disclosure) and Chinese international collaboration on the financial institution level. For the latter, it is promising to see strong ambitions of greening Chinese overseas finance through GIP and BRIGC guidance, and to see China's involvement in international standard setters (e.g., ISSB, IPSF), yet China's financial institutions are not involved in developing and applying voluntary standards (e.g., GFANZ, Equator Principles, PRI), leaving much room for growth.

5.2 Recommendations

Based on the analysis of China's green financial development as well as gaps and barriers, specific recommendations to improve green finance development in China can be developed. These recommendations can be categorized based on their potential impact on shifting finance from brown to the green and likely difficulty of implementation, as depicted in Figure 8:

https://www.mee.gov.cn/gzk/gz/202112/t20211210_963770.shtml.

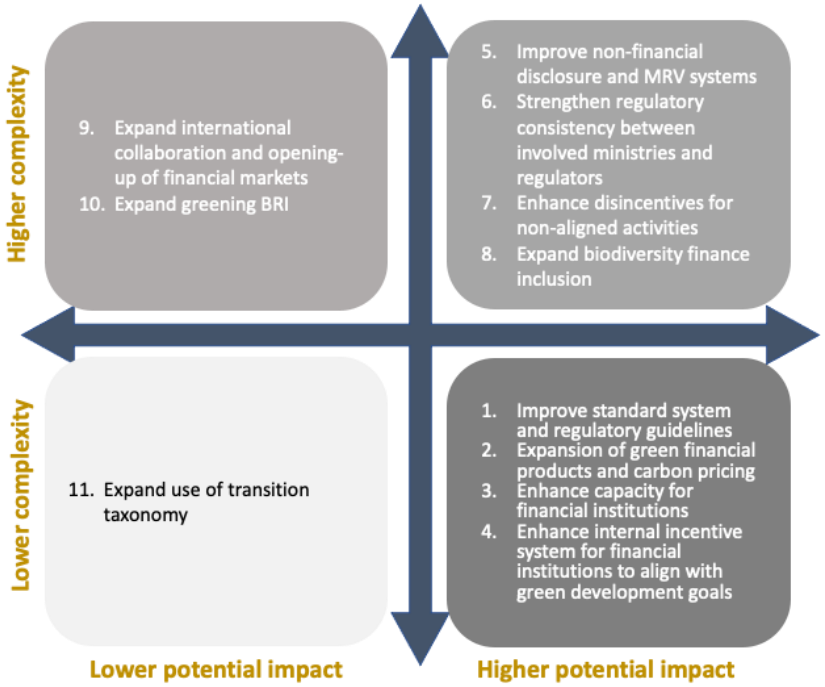


Figure 8: Heat map of potential actions on green finance development (source: authors)

1. **Improve and strengthen green finance standards, guidelines, and supporting regulatory systems.** Regulators and major financial institutions can formulate articulate, mandatory, and normative green financial policies and requirements to prevent market loopholes to reduce greenwashing. This could include
    a. new green finance instruments, such as transition finance instruments.
    b. regulations to curb activities with plausible yet hard-to-ascertain environmental benefits, such as requiring 100% use of proceeds of green bonds in the new China Green Bond Principle.
    c. Supervision and reduction of non-green financing activities, for example, clean coal-related investments and extensions of lifespans of existing coal plants
2. **Enlarge green finance in the market and expand green finance products**. Policy signals and diversified green finance products can bring more players into the market and expand green finance to boost market vitality. This could include instruments, such as transition finance with stringent carbon reduction pathways and reporting requirements (like sustainability-linked securities), expansion of

emission trading system to include non-compliance traders and derivatives, as well as encouraging larger green bond issuances to increase liquidity in the market.

3. **Enhance capacity building for financial institutions.** Regulators, research institutions, NGOs, and financial institutions can expand cooperation based on existing networks such as China Banking Alliance, Green Finance Committee, Green Finance Leadership Program, and BRIGC, with new networks and partners (e.g., universities) and provide more standardized qualification systems for environmental, social and governance (ESG) risk evaluation, management, and corporate governance. International collaboration on the capacity building can play a more prominent role to share experiences both between developed countries and China and China and BRI countries. Online platforms could support systematic capacity building of smaller financial institutions, such as local commercial banks, smaller asset managers, etc.
4. **Enhance internal incentive and restraint polices' for financial institutions.** Regulators could incorporate more criteria for banking and other financial institutions' green finance evaluation, e.g., based on their ability to provide consistent measurement, reporting, and validation of data. Furthermore, financial incentives could be extended to reduce green risks. Internally, financial institutions can build capacity and systems to incentivize loan officers and investment officers to better include green finance aspects (e.g., environmental risk evaluations, and environmental impact evaluations) in financing decisions. This would overcome the perception that green finance is a question of compliance and strengthen the individual motivation to expand the use of green finance concepts. This could include promotion and financial incentives for different levels of management in financial institutions.
5. **Advance non-financial disclosure standards and their application for financial institutions and corporations.** Currently, China has a mandatory disclosure requirement for corporates but only covers conglomerates from high environmental impact sectors, which is not enough to regulate/support small and medium-sized companies in the green technology sector. FI disclosure rules are less developed, with some pilots for non-financial disclosure implemented. Policymakers should set more stringent rules (with more severe punishment) on ESG disclosure in line with association-based standards (e.g., TCFD, TNFD) and with strong support for international standards (e.g., ISSB). This needs to be based on stronger measurement, reporting, and validation (MRV) consistent with international certification standards and procedures for third-party green assessment agencies to provide improved incentives for international

investors (e.g., in green bond markets).

6. **Strengthen consistent regulation and reduce regulatory complexity.** While various Chinese regulators have built a portfolio of policies and guidances related to green finance (e.g., NDRC, MEE, PBOC, CBIRC, CSRC), regulators could strengthen cooperation amongst each other and designate a focal point for green finance with top-level authorization to ensure higher consistency among regulators and initiatives and reduce complexity for green finance. This would provide higher transparency and clearer direction for domestic and international investors. Several actions of improved cooperation have already been successful, such as the jointly issued green finance taxonomy of 2019.
7. **Enhance disincentives for non-green activities**. Regulators should curb activities with plausible yet hard-to-ascertain environmental benefits. A foundation would be the expansion of polluting industry and activity definitions, possibly through a red finance taxonomy (like the already existing traffic light system for BRI projects that includes a "red" or discouraged activity category). Furthermore, regulators can carefully supervise and reduce non-green and not-so-green financing activities. For example, clean coal upgrades should be carefully evaluated to avoid unnecessary extension of the lifespan of existing coal-fired power plants. Next, to further ensure and elevate recent policy progress (i.e., the new guidance for outbound investment[104]), authorities can provide more stringent rules and increase accountability for those financial institutions and corporations that do not follow rules, based on introducing mandatory non-financial disclosure requirements that meet international criteria. Finally, oversight and punishment for violators should be expanded with the inclusion of grievance mechanisms in financial institutions to share responsibility for environmental violations with financial institutions.
8. **Expand international cooperation.** China is a key contributor to global green finance development through collaboration with and leadership in international bodies (e.g., G20 Sustainable Finance Working Group, NGFS, IPSF). China can expand its cooperation for non-financial disclosure in both government-supported bodies (e.g., ISSB for ESG standards) and in voluntary standard setters (e.g., TNFD, TCFD, Equator Principles). This would require incentives or at least endorsement from the top-level government for financial institutions to actively participate in such international bodies.

[104] 生态环境部, 对外投资合作建设项目生态环境保护指南 (MEE: Guidelines for the Protection of the Ecological Environment of Overseas Investment Cooperation Construction Projects), January 2022, https://www.mee.gov.cn/ywdt/xwfb/202201/t20220111_966728.shtml.

Furthermore, China can further improve access to its domestic market for international financial institutions and players in various markets. As international financial institutions might have already higher capacity and requirements for environmental and social risk management and more advanced corporate governance, international practices should be invited to "spill over" into the domestic markets, e.g., for bonds, and possibly credits.

9. **Expand biodiversity finance**: China has started to include biodiversity considerations into finance through some high-level guidances (e.g., Opinions on Deepening the Reform of Ecological Protection Compensation System issued by the General Office of the Central Committee of the Communist Party of China), through international collaboration bodies (e.g., CCICED, Green Finance Committee) and several initiatives by financial institutions. Systematic risk assessment of biodiversity-related financial risks, however, remains weak, this includes the capacity. Through improved domestic and international collaboration on biodiversity finance (e.g., TNFD), China could expand domestic capacity. Through improved disclosure regulation on biodiversity impact, for example, based on MRV systems developed for its Gross Ecosystem Product pilots, China could further expand biodiversity risk evaluations in financial institutions and financial decision-making.
10. **Expand greening of BRI:** China's cooperation with BRI countries can be strengthened to expand capacity and knowledge in BRI countries on China's green finance progress and green finance stipulations in various green finance guidelines and guidances. By having BRI countries become aware and thus require higher green finance standards in line with Chinese guidances and opinions, Chinese players would overcome the non-interference requirement of China's overseas finance, as green development requirements would be asked for by the recipient countries. Furthermore, China could support the evaluation of accelerated phase-down of coal-fired power plants to reduce potential stranded asset risks, for example in collaboration with specific host countries that signaled interest in the early retirement of coal plants, e.g., through the ADB Energy Transition Mechanism (ETM). These countries include, for example, Pakistan, and Indonesia. Finally, non-financial disclosure of BRI projects and BRI finance can be improved in line with international standards to build trust and accelerate third-country cooperation.
11. **Expand transition taxonomy:** China has been promoting transition finance and the establishment of a transition taxonomy. This ambition is in line with G20 sustainable finance road map through the Sustainable Finance Working Group co-led by China. Transition finance is important to provide finance for

hard-to-abate sectors in their transition. Yet, at this point, it is unclear whether transition finance can be successful in truly reducing emissions and nature destruction as ambitions in transition finance are due to unclear or insufficiently ambitious transition paths. Possibly it would be more relevant to provide more stringent bottom-up transition taxonomies, e.g., based on timelines of having to transition out of specific activities based on a red taxonomy, as suggested by the G20 Climate and Sustainability Working Group.

Annex

Appendix 1: Green Finance Development in China

In a historical context, green finance in China can be conceptualized into four main stages. First, environmental issues started to be considered in financial system governance in the '90s when the Chinese central bank, the People's Bank of China, issued guidance to banks on how to include environmental variables in credit decisions [105]. Second, preparation for rolling out comprehensive green finance policies started around 2012 with the preparation and launch of the China Banking Regulatory Commission's (CBRC) green credit guidance and statistics system. It further included the establishment of a People's Bank of China (PBOC) and the UN Environment Program (UNEP) task force which released their report in 2015 [106]. Based on that report, China entered its third stage in 2016 when the PBOC and six other ministry-level bodies jointly launched Guidelines on green finance, and the Green Finance Committee was established to coordinate implementation. This Guideline is the core document coordinating green finance policies across different regulatory aspects and green finance instruments that includes direct accountability built in through performance targets allocated to each ministry-level body. This enabled initial rapid progress in green finance. However, entering the fourth stage around 2020, green finance progress started stagnating, with green loans and bonds growing at the same pace as the rest of the financial system. This means that despite substantial efforts and increasing environmental and climate ambitions, progress on greening the financial system is not keeping up [107].

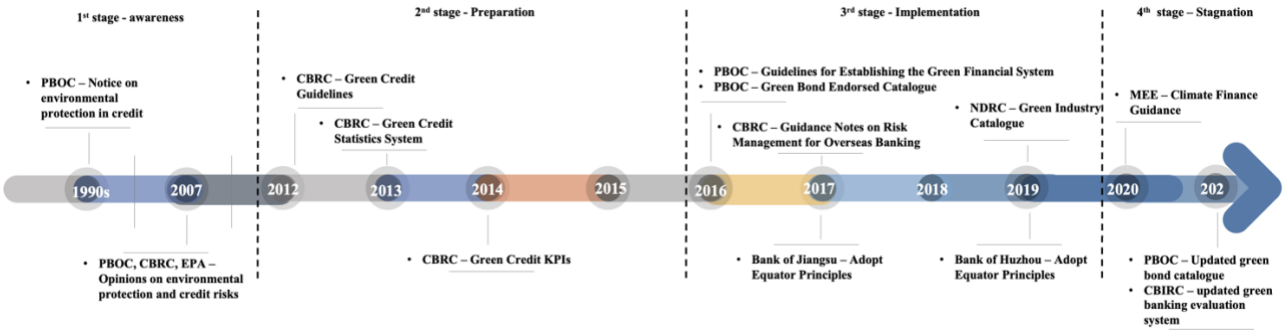


Figure: Stages of green finance development in China (Source: Authors' visualization)

[105] Donovan Escalante, June Choi, and Mathias Lund Larsen, "Green Banking in China – Emerging Trends: With a Spotlight on the Industrial and Commercial Bank of China (ICBC)" (Climate Policy Initiative, 2020), https://www.climatepolicyinitiative.org/wp-content/uploads/2020/08/Green-Banking-in-China-Emerging-Trends-1.pdf.

[106] Gongsheng Pan, Jun Ma, and Simon Zadek, "Establishing China's Green Financial System" (People's Bank of China & UNEP, 2015), https://www.unepfi.org/news/establishing-chinas-green-financial-system-report-of-the-green-finance-task-force/.

[107] Mathias Lund Larsen, "How China's Green Finance Slowdown Threatens Global Climate Ambitions," *South China Morning Post*, February 22, 2021, sec. Comment, https://www.scmp.com/comment/opinion/article/3122533/how-chinas-green-finance-slowdown-threatens-global-climate.

Appendix 2: Green Finance Regulators in China and their responsibility

The leaders in each domain were marked as “1”, supporters “2”, observers, who do not necessarily have much political power in those domains but are still engaged in certain activities as “3”.

	green finance pilot programs	financial products and innovation	green funds	green bond	green credit	green insurance	ESG disclosure	green industry	fossil fuels phase out	electricity market	ETS	emissions cap	overseas finance	international financial negotiations	MRV
NDRC (+ NEA)		2		2	2			1	1	1	1	1	2	2	1
PBoC	1	1	1	1	1			2			3			2	
MoF		2	2	1		2		2			2			1	
MEE		2			2	2	1	2	2		1			1	2
CBIRC	2	2		2	1	1	2	3					2		
CSRC		2	2	2		1	1	3					2	2	
MofCOM	3							3			3			2	
MNR		3						2	3		3			2	
SAFE		3													
MFA														2	
MIIT					3			2			2				

Main policy makers involved in climate finance related activities. (1-leader, 2-participant, 3-observer)

Note:

- NDRC (National Development and Reform Commission) is a super-ministry, main strategic economic planner in China, guides overall economic restructuring.
- NEA (National Energy Administration) sub-agency under NDRC, formulates energy strategy, controls electricity market.
- PBoC (People’s Bank of China) is the central bank, responsible for drafting and enforcing laws, and regulations that are related to monetary policy, PBoC controls issuing the RMB and controlling its circulation and regulates financial markets, including the inter-bank lending market, the inter-bank bond market, foreign exchange market.
- MoF (Ministry of Finance) Formulates and implements strategies and reforms public finance and taxation, and participation in macroeconomic policymaking.
- MEE (Ministry of Ecology and Environment), main areas of focus are on environment protection, pollution prevention and control and climate change
- CBIRC (China Banking and Insurance Regulatory Commission) supervises the business activities of banking and insurance institutions.
- CSRC (China Securities Regulatory Commission) oversees trading, custody and settlement of equity shares, bonds, and investment funds.
- MofCOM (Ministry of Commerce) formulates the policies on domestic and foreign trade and international economic cooperation, and foreign investment in China.
- MNR (Ministry of Natural Resources) responsible for managing and controlling natural resources in China.
- SAFE (State Administration of Foreign Exchange) tasked with governing foreign exchange market activities and managing the state foreign-exchange reserves.
- MFA (Ministry of Foreign Affairs) runs diplomatic affairs on behalf of the government; and handle diplomatic with foreign leaders
- MIIT (Ministry of Industry and Information Technology) plans and monitors operation of industrial branches and promotes the development of major technological innovation concerning the communication sector.

*Besides the ministries listed here, another key driver is the State-owned Assets Supervision and Administration Commission, directly under the State Council (SASAC) which is responsible for conducting SEOs reform.

References

21 世纪经济报道. “ESG 投资基金规模 8821 亿元，‘双碳’转型构建生态权益价值实现机制 (The scale of ESG investment funds is RMB 882.1 billion, and the transformation of "dual carbon" builds a mechanism for realizing the value of ecological rights and interests),” November 28, 2022. http://www.21jingji.com/article/20221128/herald/5a75ff0b4f921b4a703de0bd37f3055a.html.

———. “三季度绿色贷款余额超 20 万亿 五家大行绿色贷款增幅亮眼 (The balance of green loans in the third quarter exceeded RMB 20 trillion, and considerable growth of green loans by five major banks),” October 2022. https://m.21jingji.com/article/20221029/herald/1cb2ae1ffda8019a2d62477765b55d05.html.

———. “四大绿色金融激励措施将出，宏观审慎政策侧重防范气候风险 (Four major green financial incentives will be launched, and macro-prudential policies will focus on preventing climate risks),” April 20, 2021. https://finance.sina.com.cn/tech/2021-04-20/doc-ikmxzfmk7964944.shtml.

Asian Development Bank (ADB). “Bank of Qingdao Blue Finance Project: Report and Recommendation of the President.” Text. Asian Development Bank (ADB), January 31, 2022. China, People’s Republic of. https://www.adb.org/projects/documents/prc-55246-001-rrp.

Cheng, Evelyn. “Overseas Investors Are Snapping up Mainland Chinese Bonds.” CNBC, May 21, 2021. https://www.cnbc.com/2021/05/21/overseas-investors-buy-up-mainland-chinese-bonds-in-a-search-for-yield.html.

China Banking News. “Shanghai Pudong Development Bank Underwrites China’s First ‘Carbon Asset’ Bonds,” August 9, 2022. https://www.chinabankingnews.com/2022/08/09/shanghai-pudong-development-bank-underwrites-chinas-first-carbon-asset-bonds/.

China Development Brief. “Carbon Price Index Announced in Shanghai,” 25 2022. https://chinadevelopmentbrief.org/reports/carbon-price-index-announced-in-shanghai/.

China Dialogue. “Chinese Green Bonds Required to Use 100% of Funds for Green Purposes,” August 2022. https://chinadialogue.net/en/digest/chinese-green-bonds-100-percent-funds-for-green-purposes/.

Choi, Martin. “ESG Inflows Take a Hit in China as Investors Turn Pessimistic: Morningstar.” South China Morning Post, May 12, 2022. https://www.scmp.com/business/china-business/article/3177395/investors-shun-chinese-esg-funds-first-quarter-markets-take.

Clifford, Catherine. “Europe Will Count Natural Gas and Nuclear as Green Energy in Some Circumstances.” CNBC, July 6, 2022. https://www.cnbc.com/2022/07/06/europe-natural-gas-nuclear-are-green-energy-in-some-circumstances-.html.

Crippa, M., D. Guizzardi, M. Banja, E. Solazzo, M. Mnutean, E. Schaaf, F. Pagani, et al. *CO2 Emissions of All World Countries 2022 Report.* JRC130363. LU: Publications Office of the European Union, 2022. https://data.europa.eu/doi/10.2760/730164.

Escalante, Donovan, June Choi, and Mathias Lund Larsen. “Green Banking in China – Emerging Trends: With a Spotlight on the Industrial and Commercial Bank of China (ICBC).” Climate Policy Initiative, 2020. https://www.climatepolicyinitiative.org/wp-content/uploads/2020/08/Green-Banking-in-China-Emerging-Trends-1.pdf.

ICMA. “Sustainability-Linked Bond Principles (SLBP).” Accessed November 15, 2022. https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/sustainability-linked-bond-principles-slbp/.

IFC, 中创碳投. “中国碳价调查报告 (China Carbon Price Survey Report),” February 2022. https://finance.sina.com.cn/esg/investment/2022-02-24/doc-imcwipih5030603.shtml.

Liu, Jingyun. “PBoC Issues Green Finance Assessment Plan for Banking Institutions.” *Seneca ESG* (blog), June 11, 2021. https://www.senecaesg.com/insights/pboc-issues-green-finance-assessment-plan-for-banking-institutions/.

Lund Larsen, Mathias. “How China’s Green Finance Slowdown Threatens Global Climate Ambitions.” *South China Morning Post*, February 22, 2021, sec. Comment. https://www.scmp.com/comment/opinion/article/3122533/how-chinas-green-finance-slowdown-threatens-global-climate.

———. “Intersecting Interests and Coincidental Compatibility: How China, the EU, and the United States Can Coordinate Their Push for Globalizing Green Finance.” *Georgetown Journal of International Affairs* (blog), July 15, 2021. https://gjia.georgetown.edu/2021/07/15/intersecting-interests-and-coincidental-compatibility-how-china-the-eu-and-the-united-states-can-coordinate-their-push-for-globalizing-green-finance/.

Maguire, Gavin. “Column: China on Track to Hit New Clean & Dirty Power Records in 2022.” *Reuters*, November 23, 2022, sec. Energy. https://www.reuters.com/business/energy/china-track-hit-new-clean-dirty-power-records-2022-maguire-2022-11-23/.

NATIXIS Corporate & Investment Banking. “China Faces More Challenges in Attracting Securities Investment,” March 31, 2022. https://research.natixis.com/Site/en/publication/IChakZU58MbfNJW8jmuMlA%3D%3D?from=share.

Naughton, Barry. “Grand Steerage.” In *Fateful Decisions: Choices That Will Shape China’s Future*, 51–81. Stanford University Press, 2020.

Nedopil, Christoph, Truzaar Dordi, and Olaf Weber. “The Nature of Global Green Finance Standards—Evolution, Differences, and Three Models.” *Sustainability* 13, no. 7 (March 26, 2021): 3723. https://doi.org/10.3390/su13073723.

Pan, Gongsheng, Jun Ma, and Simon Zadek. “Establishing China’s Green Financial System.” People’s Bank of China & UNEP, 2015. https://www.unepfi.org/news/establishing-chinas-green-financial-system-report-of-the-green-finance-task-force/.

Shenzhen Government online. “City Unveils GEP System for Sustained Development_Latest News-Shenzhen Government Online,” March 24, 2021. http://www.sz.gov.cn/en_szgov/news/latest/content/post_8645665.html.

“The People’s Bank of China Issued the ‘Guidelines for Establishing the Green Financial System’ - UN PAGE - Partnership for Action on Green Economy.” Accessed November 11, 2022.

https://www.un-page.org/news/the-peoples-bank-of-china-issued-the-guidelines-for-establishing-the-green-financial-system/.

Wang, Yao. “China’s Green Finance Strategy: Much Achieved, Further to Go.” *Grantham Research Institute on Climate Change and the Environment*, 2018. https://www.lse.ac.uk/granthaminstitute/news/chinas-green-finance-strategy-much-achieved-further-to-go/.

Yahoo. “China’s First Carbon Neutrality ETFs Raise More than US$1.9 Billion as Appetite Grows for Sustainable Investing,” July 2022. https://www.yahoo.com/now/chinas-first-carbon-neutrality-etfs-093000244.html.

上海证券交易所. “关于发布《上海证券交易所上市公司自律监管指引第 1 号——规范运作》的通知 (Shanghai Stock Exchange Guidelines No. 1 for Self-Regulatory Supervision of Listed Companies—Standardized Operation),” January 7, 2022. http://www.sse.com.cn/lawandrules/sselawsrules/stock/main/listing/c/c_20220107_5679270.shtml.

———. “关于发布《上海证券交易所公司债券发行上市审核规则适用指引第 2 号——特定品种公司债券（2022 年修订）》的通知 (Notice on Issuing the "Shanghai Stock Exchange Guidelines No. 2 for the Applicability of the Review Rules for the Issuance and Listing of Corporate Bonds - Specific Types of Corporate Bonds (Revised in 2022)"),” June 2, 2022. http://www.sse.com.cn/lawandrules/sselawsrules/bond/review/c/c_20220602_5703022.shtml.

中国人民银行. “2022 年三季度金融机构贷款投向统计报告 (Statistical Report on Loan Direction of Financial Institutions in the Third Quarter of 2022),” October 28, 2022. http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4692500/index.html.

中国政府网. “2021 年末我国金融业机构总资产 381.95 万亿元.”, 2022. http://www.gov.cn/shuju/2022-03/16/content_5679310.htm.

———. “人民银行推出碳减排支持工具 (PBOC launches carbon reduction support tool),” November 18, 2021. http://www.gov.cn/xinwen/2021-11/08/content_5649848.htm.

———. “四部印发《金融标准化 ‘十四五’发展规划》(PBOC, SAMR, CBIRC, CSRC issued the "Fourteenth Five-Year Development Plan for Financial Standardization"),” February 2022. http://www.gov.cn/xinwen/2022-02/09/content_5672688.htm.

———. “国家发展改革委等部门印发《关于以制造业为重点促进外资扩增量稳存量提质量的若干政策措施》的通知 (NDRC et al, Several Policies and Measures Concerning Promoting Foreign Capital Expansion, Stabilization, and Quality Improvement by Focusing on the Manufacturing Industry),” October 2022. http://www.gov.cn/zhengce/zhengceku/2022-10/25/content_5721563.htm.

———. “国资委要求中央企业"一企一策"制定碳达峰行动方案 (SASAC requires central enterprises to formulate carbon peak action plan "one enterprise, one plan"),” October 2022. http://www.gov.cn/xinwen/2022-10/07/content_5715977.htm.

———. “江苏：发绿色债券贴息 30% 绿色企业上市奖励 200 万元 (Jiangsu: Issuing green bonds with a discount of 30% and rewarding green enterprises with RMB 2 million for listing),” 2019. http://www.gov.cn/xinwen/2019-08/17/content_5421985.htm.

———. “首笔绿色气候基金花落山东 (The first green climate fund was awarded to Shandong),” December 2019. http://www.gov.cn/xinwen/2019-12/12/content_5460516.htm.

中国新闻网. “我国年内已发行绿债 7445 亿元 规模超去年全年 (China has issued green bonds of RMB 744.5 billion this year, exceeding the scale of last year),” November 24, 2022. https://chinanews.com.cn/cj/2022/11-24/9901050.shtml.

中国清洁发展机制基金. “绿色指数化投资基金规模超 1300 亿元 同比增长 16% (The scale of green index investment funds exceeded RMB 130 billion, a year-on-year increase of 16%),” October 2022. https://www.cdmfund.org/index.php/31830.html.

中国社会科学院经济研究所等. “《中国上市公司蓝皮书中国上市公司发展报告（2022）》 (Blue Book of Chinese Listed Companies: Development Report of Chinese Listed Companies),” November 23, 2022. http://ie.cass.cn/academics/academic_activities/202211/t20221123_5566122.html.

中国经济网. “18 家机构通过绿标委注册——绿色债券市场强化行业自律 (18 institutions have passed the registration of the Green Standard Committee - the green bond market strengthens industry self-discipline),” September 2022. http://www.ce.cn/xwzx/gnsz/gdxw/202209/29/t20220929_38134392.shtml.

———. “易纲重磅发声 货币政策将继续从总量上发力 (Yi Gang made a big statement that monetary policy will continue to exert force from the aggregate),” June 28, 2022. http://finance.ce.cn/bank12/scroll/202206/28/t20220628_37808554.shtml.

中国证券监督管理委员会. “证监会发布修订后的上市公司年度报告和半年度报告格式准则 (CSRC: the revised guidelines for the format of annual reports and semi-annual reports of listed companies),” June 2021. http://www.csrc.gov.cn/csrc/c100028/cb25156c4913f4c9ea6b658cad8011f17/content.shtml.

中国货币市场. “可持续发展挂钩债券的发展现状与政策建议 (Development Status and Policy Suggestions of Sustainable Development Linked Bonds),” Accessed November 14, 2022. https://cj.sina.com.cn/articles/view/6314832590/http%3A%2F%2Fcj.sina.com.cn%2Farticles%2Fview%2F6314832590%2F17864b2ce0010117qt.

中国金融. “提升金融机构环境信息披露能力 (Improving the ability of financial institutions to disclose environmental information),” May 2022. https://finance.sina.com.cn/money/bank/yhpl/2022-05-12/doc-imcwiwst6974348.shtml.

中国金融学会绿色金融专业委员会. “人民银行副行长宣昌能：进一步做好绿色金融与转型金融的有效衔接 (Xuan Changneng, Deputy Governor of the PBOC: Further improve the effective connection between green finance and transition finance),” November 2022. http://greenfinance.org.cn/displaynews.php?id=3907.

———. “绿金委金融支持生物多样性保护研究组成果发布 (Green Finance Committee Financial Support Biodiversity Conservation Research Group Releases Results),” November 12, 2022. http://greenfinance.org.cn/displaynews.php?id=3920.

中国银保监会. “关于印发银行业保险业绿色金融指引的通知 (Notice on Issuing the Green Finance Guidelines for the Banking and Insurance Industry),” June 2022. http://www.gov.cn/zhengce/zhengceku/2022-06/03/content_5693849.htm.

中国银行. “中行成功发行全球金融机构首笔生物多样性绿色债券 (Bank of China successfully issued the first biodiversity green bond of a global financial institution),” September 29, 2021. https://www.boc.cn/aboutboc/bi1/202109/t20210930_20119935.html.

中国银行市场间交易商协会. “交易商协会推出可持续发展挂钩债券 (National Association of Financial Market Institutional Investors (NAFMII). Notice on Launching Innovation Pilot Programs Related to Transition Bonds),” April 2021. http://www.nafmii.org.cn/xhdt/202104/t20210428_197371.html.

中央财经大学绿色金融国际研究院. “2020 年绿色基金市场进展及相关建议 (2020 Green Fund Market Progress and Related Suggestions),” May 2021. https://www.hbzhan.com/news/detail/141663.html.

京报网. “北京将承建全国自愿减排交易中心，探索与国际碳交易机制接轨 (Beijing will construct a national voluntary emission reduction trading center to explore the integration with the international carbon trading mechanism),” February 2022. https://news.bjd.com.cn/2022/02/16/10043380.shtml.

人民网. “绿色金融改革创新试验区再扩容 积累我国绿色金融体系"重庆经验" (The Green Finance Reform and Innovation Pilot Zone will be expanded again to Chongqing to accumulate experience of China's green finance development),” August 2022. http://finance.people.com.cn/n1/2022/0828/c1004-32513183.html.

———. “陈雨露：绿色金融‘三大功能’‘五大支柱’助力碳达峰碳中和 (Vice governor of PBOC Chen Yulu: Green Finance's "Three Functions" and "Five Pillars" Help Carbon Peak Carbon Neutralization),” March 2021. http://finance.people.com.cn/n1/2021/0307/c1004-32044837.html.

全国金融标准化技术委员会. “《环境权益融资工具》金融行业标准正式发布 (The financial industry standard of "Environmental Equity Financing Instruments" was officially released),” August 2022. https://www.cfstc.org/jinbiaowei/2929436/2980681/index.html.

兴业银行. “绿色金融再创先！兴业银行首家推出生物多样性保护金融方案 (Industrial Bank is the first to launch a financial plan for biodiversity protection),” August 2022. https://www.cib.com.cn/cn/aboutCIB/about/news/2022/20220811.html.

北京市地方金融监督管理局等. “《‘两区’建设绿色金融改革开放发展行动方案》(Beijing Local Financial Supervision and Administration Bureau: "Action Plan for Reform and Opening-up Development of Green Finance in 'Two Districts'"),” August 2022. http://www.igea-un.org/cms/show-6669.html.

和讯网. “华侨永亨银行发行境内首单外资银行绿色金融债 (OCBC Wing Hang Bank issued the first green financial bond of a foreign bank in China),” Accessed November 16, 2022. http://bank.hexun.com/2022-11-17/207115737.html.

国家发展和改革委员会. “国家发展改革委新闻发布会 介绍生态文明建设有关工作情况 (National Development and Reform Commission: press conference to introduces the work related to the construction of ecological civilization),” September 21, 2022. https://www.ndrc.gov.cn/xwdt/wszb/stwmjsyggzqk/?code=&state=123.

———. “国家发展改革委环资司召开碳达峰、碳中和专家座谈会 (The National Development and Reform Commission's Environmental Protection Division held a carbon peak and carbon neutral expert symposium),” March 22, 2021. https://www.ndrc.gov.cn/fzggw/jgsj/hzs/sjdt/202103/t20210322_1269949.html?code=&state=123.

广东省人民政府办公厅. “关于印发广东省发展绿色金融支持碳达峰行动实施方案的通知 (Notice on Issuing the Implementation Plan of Guangdong Province to Develop Green Finance to Support Carbon Peak Action),” July 2022. https://www.gd.gov.cn/zwgk/wjk/qbwj/ybh/content/post_3972447.html.

广州市黄埔区人民政府. “《广州市黄埔区 广州开发区促进绿色金融发展政策措施实施细则（修订）》(Implementation Rules for Policies and Measures for Promoting Green Finance Development in Huangpu District, Guangzhou City and Guangzhou Development Zone (Revised)),” November 2022. http://www.hp.gov.cn/zwgk/zcjd/zcjd/content/post_8673588.html.

新浪网. “中铝绿色低碳基金完成备案 (Green and Low Carbon Fund of Aluminum Corporation of China completed the filing,” November 2022. https://finance.sina.com.cn/tech/roll/2022-11-11/doc-imqmmthc4190892.shtml.

新浪财经. “易纲：截至今年 9 月末碳减排支持工具累计使用 2400 多亿元 支持碳减排贷款超过 4000 亿元 (Yi Gang: As of the end of September this year, more than RMB 240 billion of CERF have been used, which supported more than RMB 400 billion loans),” November 21, 2022. https://finance.sina.com.cn/china/gncj/2022-11-21/doc-imqmmthc5424081.shtml.

———. “香港交易所成立香港国际碳市场委员会 布局发展碳市场 (HKEX Establishes Hong Kong International Carbon Market Committee to Develop Carbon Market),” July 2022. https://finance.sina.com.cn/stock/hkstock/hkzmt/2022-07-05/doc-imizmscv0193682.shtml.

标普道琼斯指数. “中银香港携手标普道琼斯指数推出首个聚焦粤港澳大湾区的气候转型指数 (BOCHK and S&P Dow Jones Indices launched the first climate transition index focusing on the Guangdong-Hong Kong-Macao Greater Bay Area),” July 2022. https://www.spglobal.com/spdji/zh/index-launches/article/bochk-and-sp-dow-jones-indices-launches-the-first-climate-transition-index-targeting-the-greater-bay-area/.

海南省人民政府网. “海南国际碳排放权交易中心获批设立 (Hainan International Carbon Emissions Trading Center Approved to Establish),” March 2022.

https://www.hainan.gov.cn/hainan/tingju/202203/19eaf1b283004947874d696d1e20fda9.shtml.
深圳市人民代表大会常务委员会. “深圳经济特区绿色金融条例--深圳市法规及规章 (Shenzhen Special Economic Zone Green Finance Regulations--Shenzhen City Laws and Regulations),” November 2020. http://www.sz.gov.cn/cn/xxgk/zfxxgj/zcfg/szsfg/content/post_8290626.html.
深圳市地方金融监督管理局，中国人民银行深圳市中心支行，中国银行保险监督管理委员会深圳监管局，中国证券监督管理委员会深圳监管局. “关于印发《深圳市金融机构环境信息披露指引》的通知 (Notice on Issuing the "Guidelines for Environmental Information Disclosure of Financial Institutions in Shenzhen"),” September 30, 2022. http://jr.sz.gov.cn/sjrb/ydmh/isz/zcfg/szsjrzc/jrfzzc/content/post_10150984.html.
深圳市政府. “深圳市人民政府关于构建绿色金融体系的实施意见 (Shenzhen Municipal People's Government: Implementation Opinions on Building a Green Financial System),” January 2019. http://www.sz.gov.cn/zwgk/zfxxgk/zfwj/szfwj/content/post_6577287.html.
深圳证券交易所. “关于发布《深圳证券交易所上市公司自律监管指引第 1 号——主板上市公司规范运作》 的通知 (Shenzhen Stock Exchange Guidelines for Self-Regulatory Supervision of Listed Companies No. 1—Standardized Operation of Companies Listed on the Main Board),” January 7, 2022. http://www.szse.cn/lawrules/rule/stock/main/t20220107_590547.html.
湖州市人民政府. “关于金融支持生物多样性保护的实施意见 (Huzhou Municipal Government: Implementation Opinions on Financial Support for Biodiversity Protection),” August 2022. http://www.huzhou.gov.cn/art/2022/8/15/art_1229561845_1667141.html.
生态中国网. “全国碳市场成交量突破 2 亿吨大关 专家预计我国碳价将逐步走高 (The transaction volume of the national carbon market has exceeded 200 million tons. Experts predict that the carbon price will gradually rise),” November 28, 2022. https://www.eco.gov.cn/news_info/60191.html.
———. “国资委: 力争 2023 年央企上市公司 ESG 专项报告披露 ‘全覆盖 (SASAC: Strive to achieve 'full coverage' on ESG disclosure of listed companies of state-owned enterprises in 2023),’” May 2022. https://www.eco.gov.cn/news_info/55577.html.
———. “《银行业金融机构支持生物多样性保护共同宣示》发布 ("Joint Declaration of Banking Financial Institutions Supporting Biodiversity Conservation" Released),” October 25, 2021. https://www.eco.gov.cn/news_info/50155.html.
生态环境部. “企业环境信息依法披露管理办法-第五章 罚则 (Measures for the Administration of the Lawful Disclosure of Enterprise Environmental Information - Chapter V Penalties),” December 2021. https://www.mee.gov.cn/gzk/gz/202112/t20211210_963770.shtml.
———. “《对外投资合作建设项目生态环境保护指南》 (MEE: Guidelines for the Protection of the Ecological Environment of Overseas Investment Cooperation Construction

Projects),” January 2022. https://www.mee.gov.cn/ywdt/xwfb/202201/t20220111_966728.shtml.

“生态环境部发布《全国碳排放权交易市场第一个履约周期报告》(MEE released 'National ETS first compliance circle' report),” January 1, 2023. https://www.mee.gov.cn/ywdt/xwfb/202301/t20230101_1009228.shtml.

“生态环境部召开 10 月例行新闻发布会 (MEE held a regular press conference in October),” October 27, 2022. https://www.mee.gov.cn/ywdt/zbft/202210/t20221027_998163.shtml.

生态环境部等. “关于公布气候投融资试点名单的通知 (Ministry of Ecology and Environment: Notice on Publishing the List of Climate Investment and Financing Pilots),” August 2022. https://www.mee.gov.cn/xxgk2018/xxgk/xxgk04/202208/t20220810_991388.html.

界面新闻. “科创板年报新要求确认：公司需增加 ESG 相关信息披露 (New Requirements for Sci-Tech Innovation Board Annual Report Confirmed: Companies Need to Increase ESG-related Information Disclosure),” January 19, 2022. https://www.163.com/dy/article/GU3EQEK20534A4SC.html.

资本市场标准网. “碳金融产品 (Carbon Financial Products),” April 2022. http://www.csisc.cn/zbscbzw/wg61hh/202204/3fc33d5207ee452bbc48c457a8de681c.shtml.

“首期规模 45 亿！北京绿色基础设施投资基金成功设立 (The scale of the first phase is 4.5 billion! Beijing Green Infrastructure Investment Fund was successfully established),” December 31, 2021. https://www.chinalifeinvest.com/html1/report/22011/6-1.htm.

About the authors

Dr. Christoph NEDOPIL WANG is the Director of the Green Finance & Development Center at FISF Fudan University, an Associate Professor at Fudan University in Shanghai, China, a Senior Research Fellow at the Central University of Finance and Economics (CUFE) in Beijing, China, and a visiting faculty at Singapore Management University.

Christoph has contributed to economic research and policy development for green finance with a focus on climate and biodiversity amongst others for the China Council for International Cooperation on Environment and Development (CCICED), the Ministry of Ecology and Environment (MEE), the BRI Green Development Coalition (BRIGC), various private and multilateral finance institutions (e.g. ADB, IFC), as well as multilateral institutions (e.g. UNDP, UNESCAP) and international governments.

Christoph has co-authored several books and reports, including the Green Development Guidance for BRI projects and the Implementation Guide (backed by MEE and other relevant parties), UNDP's SDG Finance Taxonomy, IFC's "Navigating through Crises" and IFC's "Corporate Governance – Handbook for Board Directors", as well as multiple academic papers on capital flows, sustainability and international development.

Ziying SONG is a researcher at the Green Finance & Development Center. She previously served as a Senior Analyst at CDP and a consultant at China Energy Conservation and Environmental Protection Group (CECEP) in Beijing, China. She has worked on cross-sectional projects in energy transition, climate change, and sustainable finance area.

Ziying graduated from Johns Hopkins University (JHU) with a master's degree in Energy Economics and Management. She also had intern experience with GlobalFoundries, APEC, and South China Institute of Environmental Science of MEE. She is keen to have a deeper dive on research topics at GFDC and deems to develop a long-term career in this field.

About the Green Finance & Development Center

The Green Finance & Development Center (GFDC) is a leading research center that provides advisory, research and capacity building for financial institutions and regulators for green and sustainable finance in China and internationally.

The GFDC works at the intersection of finance, policy and industry to accelerate the development and use of green and sustainable finance instruments to address the climate and biodiversity crisis, as well as contribute to better social development opportunities.

The topics of our work at the Green Finance & Development Center respond to the needs and developments of the financial markets and related policies in China and internationally, while we also aim to provide evidence-based advisory and research for future policies and strategies to accelerate the greening of finance in policy and practice.

To drive green finance development, GFDC works in four inter-related labs:

1. Green BRI Lab
2. ESG Lab
3. Green Innovation Lab
4. Biodiversity Finance Lab

The Green Finance & Development Center was founded in 2021 and continues much work from the IIGF Green BRI Center. It is associated with the Fanhai International School of Finance (FISF) at Fudan University in Shanghai, P.R. China.

Contact us for more detailed analysis on Green Finance, the Belt and Road Initiative and sustainable development

Green Finance & Development Center

Fanhai International School of Finance (FISF)
Fudan University

220 Handan Road, Yangpu District, Shanghai, P.R. China, 200433

复旦大学泛海国金融学院绿色金融与发展中心

200433 上海市杨浦区邯郸路 220 号

info@greenfdc.org II www.greenfdc.org