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STOCKTAKING SUSTAINABLE FINANCE PRODUCTS IN CHINA

FINAL REPORT

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Since 2022 the IKI is implemented by the Federal Ministry for Economic Affairs and Climate Action (BMWK) in close cooperation with the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) and AA. Through the IKI, the ministries jointly support approaches in developing and emerging countries to implement and ambitiously develop the Nationally Determined Contributions (NDCs) anchored in the Paris Agreement.

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Cover picture: Chongqing urban landscape, landmarks and solar panels @Freepit

Abstract

Finance will play a crucial role in the world's green and sustainable development. For China, to achieve its goals of peaking carbon emissions before 2030 and reaching carbon neutrality before 2060 ("dual carbon" goals), its entire economy and society will inevitably undergo a wide-ranging and profound systemic transformation. In this process, the financial market will not only provide hundreds of billions of RMB financial support but will also continue to develop in a greener and more sustainable approach.

In recent years, driven by top-down policies, China's green finance has developed apace, with rapidly expanding market and continuous product innovations. Also, it is gradually turning to sustainable finance which has a wider range of connotations. As China put forth "dual carbon" goals, climate investment and financing has also become one of the most important areas of green finance. In spite of the rich achievements, there still exists the financial gap in realizing carbon neutrality and other sustainable development goals. With the advancement of China's "dual carbon" goals, and other green and sustainable goals, the sustainable finance market in the country will also continue to evolve and show new trends. In this context, this report provides a comprehensive overview of the development of China's sustainable financial products and markets in recent years, as well as an outlook for future trends.

This report mainly contains the following three sections:

(1) **Overview of the sustainable finance market in China**. This section sorts out the concepts related to sustainable finance in China, as well as relevant background and policy framework. Concepts: there are relatively clear official s for green finance and climate investment and financing in China. Although no official definition for sustainable finance is available now, the market consensus has formed. Background and policy framework: recent years have witnessed green finance become a major support and guarantee for China to promote ecological civilization and green development. Top-level policies and institutional arrangements for various fields have continued to improve, including the standard system, information disclosure system, and product policies. Furthermore, pilot projects have also been launched in some localities. As the construction of eco-civilization in the country enters a new stage in which carbon emission reduction become the major strategic direction, institutional rules and policies related to climate investment and financing are also being enriched and refined.

(2) **Inventory of sustainable financial products and markets in China**. This section makes a comprehensive inventory of sustainable financial products and markets in China, including relevant standards and polices, market overviews and typical cases. They mainly include five categories of product tools: 1)debt products and tools, including green loan, green, social and sustainable development bonds, transition financing products, green financing leasing and other innovative products; 2) equity products and tools, including green investment (green funds, green PE/VC, green indices, green trusts), ESG investment products (ESG indices, ESG funds, ESG wealth management), climate investment and financing products (climate indices, climate funds, climate private equity investments, etc.); 3) green insurance and disaster risk financial instruments; 4) green fintech; 5)cross-border financial products, including offshore green bonds, green panda bonds, etc.

(3) **Outlook for sustainable financial products and markets in China.** This section features an outlook for the future development of sustainable financial products and markets in China, which will show four major trends: first, the rapid development of transition financial products; second, from "green" to "sustainable": the innovative integration of green finance and inclusive finance; third, the diversified development of green and sustainable financial markets; fourth, the continuous deepening of international cooperation between green finance and sustainable finance.

About the Authors

CIB Economic Research and Consulting Co., Ltd.

CIB Economic Research and Consulting Co., Ltd. (“CIB Research” for short) was founded on June 1, 2015, in Shanghai and began operations on June 28. It is a member institution of China Industrial Bank (CIB) and China's first bank-affiliated research company operating as a separate legal entity. The company operates on a market-oriented mechanism.

CIB Research has three research sections: strategies, markets and industries, and it does professional research on the macro economy, green finance, the financial industry, currencies & commodities, fixed income, and different industry segmentations. It continues to broaden the scope and depth of its research to improve the overall quality and efficiency of its services.

The long-standing mission of CIB Research is to serve the high-quality growth of China's economy, and it is guided by the new development philosophy of innovative, coordinated, green, open, and shared development. It is dedicated to fostering the integration of professional research and financial practice as well as actively contributing research wisdom to China's economic transition.

CIB Institute for Carbon Neutrality and Finance

CIB Institute for Carbon Neutrality and Finance (ICNF) was initiated and established by CIB Research, a member institution of CIB, on the basis of a green finance research team.

With the purpose of serving the national "Dual Carbon" target and aiming to become a leading national green finance think tank in China’s banking industry, ICNF deepens research on carbon and finance, focusing on green finance, climate change and environmental economics, and low-carbon transformation of energy and industry. In order to become an active participant in the formulation of China’s green finance policies, ICNF is dedicated to providing intellectual support for the "dual carbon" strategic decision-making of government agencies. ICNF has also been committed to benchmarking the national strategy for coordinated regional development so as to serve the green and low-carbon development of key areas, as well as providing more forward-thinking insight to assist CIB in meeting the "Dual Carbon" target and developing green finance strategies in order to bolster CIB’s leading position in the field of green finance. ICNF has a strong comprehensive research force composed of full-time researchers, part-time researchers within the CIB, and external experts (i.e., the Carbon Finance Academic Expert Committee). ICNF also has senior professionals with rich experience in the fields of green finance and banking, energy and energy conservation, carbon markets and carbon accounting, as well as industrial green and low-carbon transformation planning and implementation.

ICNF has completed quite a few green finance-related projects for some international organizations, ministries and commissions, local governments, associations, CIB and others. The CIB Green Producers’ Index (GPI) it releases on a monthly basis has become a benchmark for the development of green industries in the country. What's more, it joins hands with the International Finance Corporation (IFC) to hold the "Green Finance Workshop" every year, which has become an important platform for capacity building and communication within the industry.

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1. Overview of the Sustainable Finance Market in China

1.1 Concepts related to sustainable finance in China

To realize green and sustainable development, both developed and developing countries need substantial financial support. As the core of modern economy and the hub of social resource allocation, finance should guide and optimize resource factors more accurately to serve green and sustainable development. The concepts of "Sustainable Finance", "Green Finance", and "Climate Finance (Climate Investment and Financing)" have thus been created and are still evolving.

In China, there are clear official definitions for "Green Finance" and "Climate Investment and Financing". Although no official definition for "Sustainable Finance" is available now, the market consensus has formed. In general, Climate Finance (Climate Investment and Financing) refers to those investment and financing activities that are done to adapt to or mitigate climate change, thus being an important part of Green Finance. The scope of Green Finance is bigger than that of Climate Finance with additional environmental objectives to support, including environmental improvement, pollution control, natural capital protection, and the efficient use of resources. The scope of Sustainable Finance is even more inclusive. Besides environment-related issues, it also pays attention to the goals related to sustainable development in the social and economic fields.

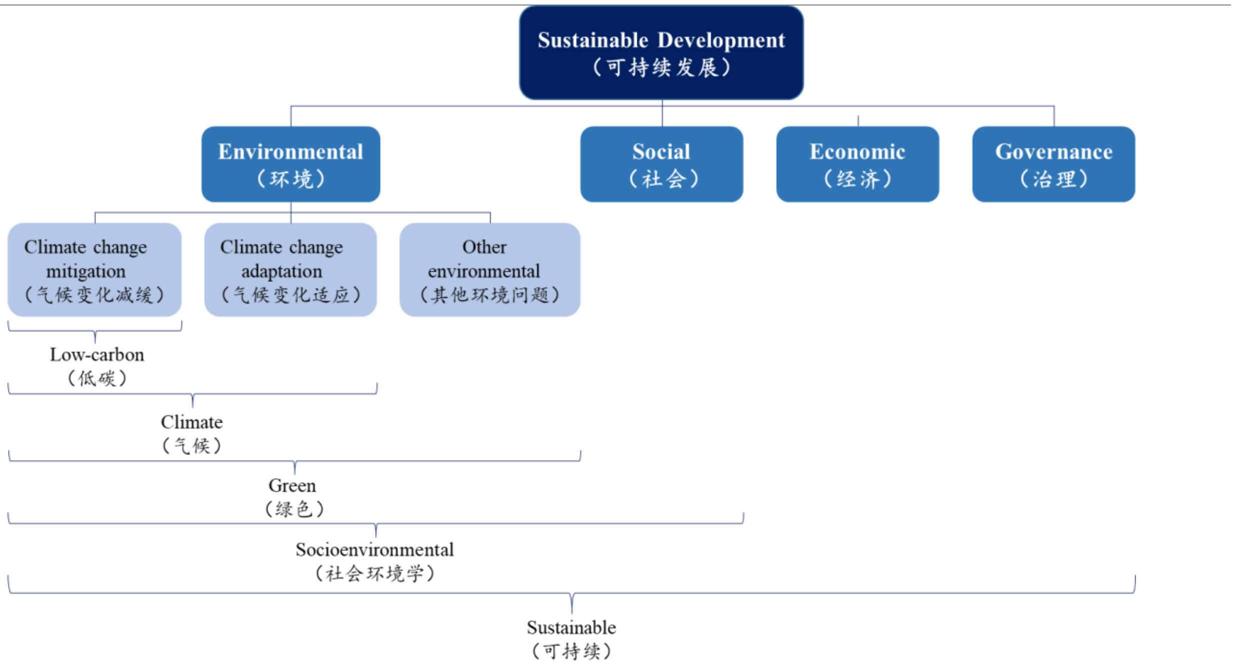
Table 1: China's Official Definitions for Green Finance, Climate Investment and Financing, and Sustainable Finance

Concept	Chinese definition	Source
Climate Investment and Financing	Climate investment and financing refers to those investment and financing activities that are designed to guide and promote the flow of more funds into tackling climate change to facilitate the Nationally Determined Contributions and the low-carbon development objectives, thus constituting an important part of green finance.	In October 2020, five ministries, including the Ministry of Ecology and Environment (MEE), the National Reform and Development Commission (NDRC), the People's Bank of China (PBoC), jointly issued the ***Guidance on Promoting Investment and Financing in Response to Climate Change***.
Green Finance	Green finance refers to the economic activities that are conducive to environmental improvement, climate change response, and efficient use of resources, that is, the financial services provided for investment and financing, operations, and risk management, among other things, with respect to projects in such areas as environmental protection, energy conservation, clean energy, green transportation, and green building.	In August 2016, the People's Bank of China (PBoC), along with six other government agencies including the Ministry of Finance and the National Reform and Development Commission (NDRC), issued the ***Guidelines for Establishing the Green Financial System in China.***
Sustainable Finance	No official definition is available now, but the market consensus includes: In a narrow sense, sustainable finance refers to investment and financing activities that integrate environmental, social and governance (ESG)	

	factors into business decisions, economic development and investment strategies. In a broad sense, sustainable finance, which is linked to the concept of sustainable development and the sustainable development goals (SDGs), refers to the financial instruments and systems that are designed to support the achievement of the international SDGs and help the economy and society achieve sustainable development.

Source: PBoC,MEE, etc., CIB Institute for Carbon Neutrality and Finance

Figure 1: Scopes of Sustainable Finance, Green Finance, and Climate Finance



Source: UNEP

1.2 Background and policy framework of sustainable finance in China

1.2.1 Background: With the deepening of eco-civilization construction, the green development in China has entered a new stage.

In recent years, China's green finance has developed apace, which is mainly due to the fact that the eco-civilization construction and green development in the country keep advancing.

Since the 18th CPC National Congress, further headway has been made in promoting eco-civilization in the country. Especially, the strategic layout and ideological construction have continued to mature, and the top-level design and institutional system have continued to improve. These have led to historic, transformative and comprehensive changes in China's eco-civilization construction from theory to practice. As the country put forth the "dual carbon (2030 carbon peaking and 2060 carbon neutrality)" goals, eco-civilization construction and green development have entered a new stage of development.

The strategic layout and ideological construction of eco-civilization have continued to mature. In 2012, the 18th CPC National Congress included eco-civilization construction in the Five-Sphere Integrated Plan to build socialism with Chinese characteristics. In 2015, the fifth plenary session of the 18th Central Committee of the CPC listed the concept of "green development" as one of the five new concepts for development. In 2017, in the report to the 19th CPC National Congress: i)the "Beautiful China" initiative was written into as an important goal of China's socialist modernization for the first time; ii) it was emphasized that the building of eco-civilization is vital to sustain the Chinese nation; iii)"ensuring harmony between human and nature" became one of the basic policies to uphold and develop socialism with Chinese characteristics in the new era; and iv)pollution prevention and control was among the three hard nuts to crack. In 2018, the National Conference on Ecological Environment Protection pointed out that building an ecological civilization is vital to sustain the Chinese nation, and at the same time, the Conference put forth Xi Jinping's Thought on Ecological Civilization which elevated the Party's understanding of the laws of ecological civilization construction to a new level.

The top-level design and institutional system of ecological civilization have continued to improve. At the meeting of the Political Bureau of the CPC Central Committee held in September 2015, the *Integrated Reform Plan for Promoting Ecological Progress* was considered and adopted, thus becoming the top-level design and deployment of reform in the field of ecological civilization. The legal construction of ecological civilization keeps advancing: since the 18th CPC National Congress, the country has implemented the functional zoning strategy, established and improved a series of important institutional systems, including the property rights system for natural resource assets, the system for the development and protection of territorial space, and the system for evaluating officials' ecological conservation performance and for holding those responsible for ecological damage to account. Furthermore, a number of laws and regulations have been formulated and revised, including the *Environmental Protection Law*, *Air Pollution Prevention and Control Law*, and the *Water Pollution Prevention and Control Law*. The introduction of the central ecological environment protection and inspection mechanism has turned out to be a very effective way to fulfill the responsibility of ecological environmental protection.

China proposed the "dual carbon" goals for the first time and updated its Intended Nationally Determined Contributions (INDCs) document, which marks a new stage in the building of an ecological civilization and green development. In recent years, China actively participated in international negotiations on climate change and submitted its INDCs document to address climate change. Also, it proposed to "jointly build a community with a shared future for mankind", vigorously promoted South-South cooperation on climate change, made green and low-carbon development an important part of its eco-civilization construction and continued to advance efforts in tackling climate change. During the general debate of the 75th Session of the UN General Assembly on September 22, 2020, China President Xi Jinping announced in his speech, "China will scale up its INDCs by adopting more vigorous policies and measures. We aim to have CO_2 emissions peak before 2030 and achieve carbon neutrality before 2060." This is the first time that China explicitly stated the carbon neutrality goal. Also, it accelerated the CO_2 emissions peak target it committed in 2015. In 2021, China submitted to the UN the *Achievements, New Goals and New Measures of China for Intended Nationally Determined Contributions*, meaning that the "dual carbon" goals were officially written into its new INDCs document. Eco-civilization construction in the country has entered a critical period in which with carbon emission reduction as the major strategic direction, efforts are needed to promote synergy between pollution reduction and carbon emission reduction, boost comprehensive green transformation of socio-economic development, and realize the shift from quantitative expansion to qualitative improvement in ecological environment quality. From 2020 to 2023, the Central Committee of the CPC and the State Council unveiled the Opinions on Well Implementing the New Development Philosophy and Steadily Promoting Carbon Peaking and Carbon Neutrality; the State Council released the Action Plan for Carbon Emission Peaking Before 2030; relevant departments issued 12 implementation plans for key areas and industries and 11 support schemes; 31 provinces (autonomous regions and municipalities directly under the central government) worked out local action plans for carbon peaking. In this way, the China's "1+N" policy framework1 for carbon peaking and carbon neutrality has been basically put in place.

[1] refers to the long-term approach to combating climate change, which is well documented in The Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy issued on October 24. “N” refers

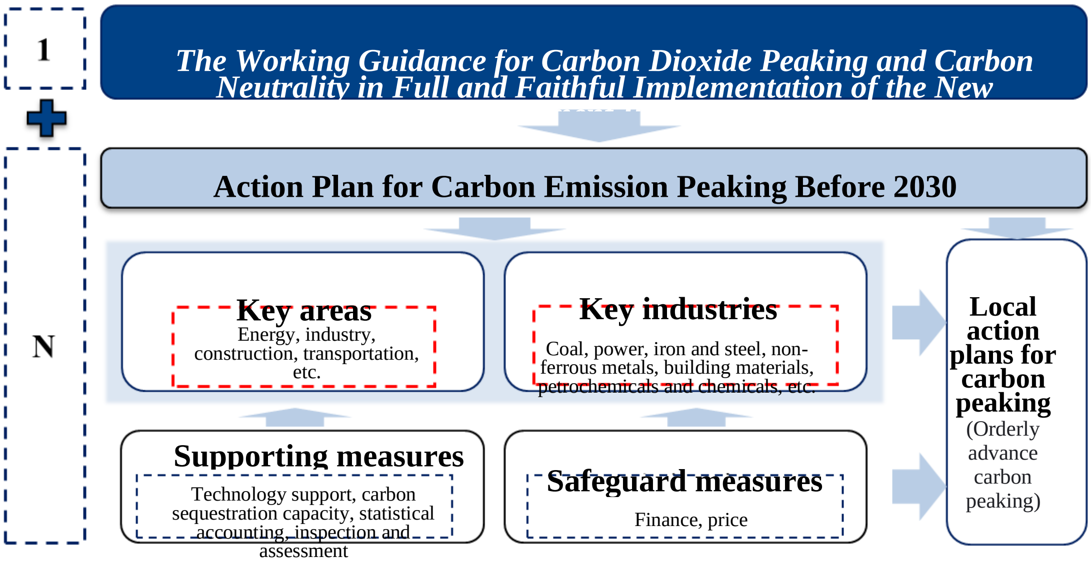
Table 2: China enhances its INDC targets in response to climate change

Targets	**2015** ***Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions***	**2021** ***Achievements, New Goals and New Measures of China for Intended Nationally Determined Contributions***
Total targets	Peak carbon dioxide emissions **around 2030** and **try to achieve** this goal as early as possible	Peak carbon dioxide emissions **before 2030** and try to achieve **carbon neutrality before 2060**
Intensity targets	By 2030, China's CO_2 emissions per unit of GDP will be **60-65% lower than the 2005 level**.	By 2030, China's CO_2 emissions per unit of GDP will be **more than 65% lower than the 2005 level**
Non-fossil energy development	By 2030, the proportion of non-fossil energy in primary energy consumption will **reach around 20%.**	By 2030, the proportion of non-fossil energy in primary energy consumption will **reach around 20% by 2030, and the total installed capacity of wind and solar power will exceed 1.2 billion kilowatts.**
Forest stock	By 2030, forest stock will **increase by about 4.5 billion cubic meters** from the 2005 level.	By 2030, forest stock will **increase by about 6 billion cubic meters** from the 2005 level.

Source: data collected by CIB Institute for Carbon Neutrality and Finance

to solutions to achieve peak carbon emissions by 2030, starting with the Action Plan for Carbon Dioxide Peaking Before 2030 issued on October 26.

Figure 2: The "1+N" policy system for carbon peaking and carbon neutrality has been basically put in place in China



Source: CIB Institute for Carbon Neutrality and Finance

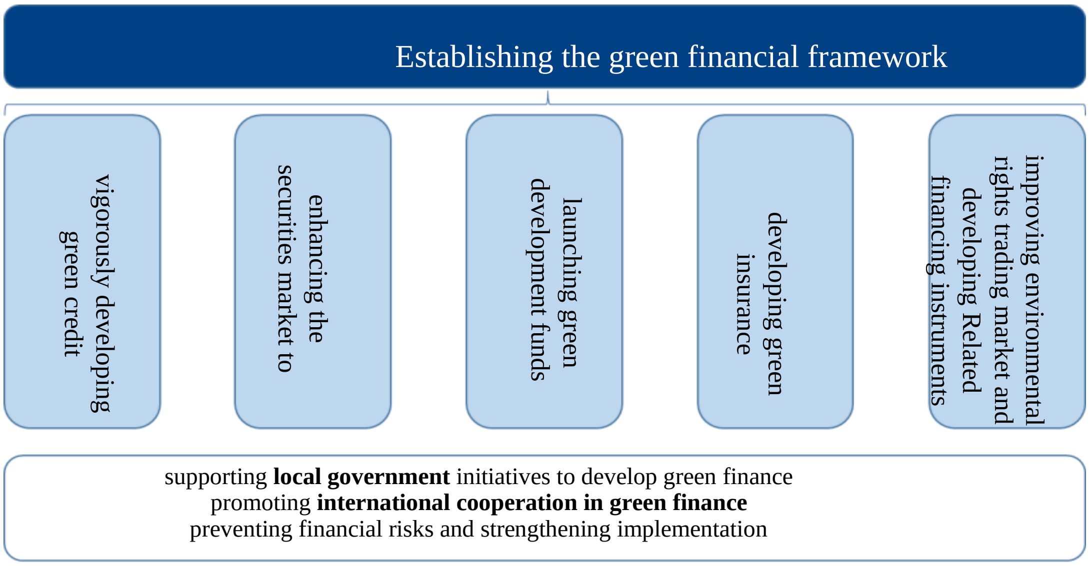
1.2.2 China's green financial policy system has been basically set up

In recent years, China drew up and introduced a series of policies and systems to promote the development of green finance. The establishment and continuous improvement of green financial system has provided impressive support for green development in the country.

(1) The establishment of the top-level system for green finance in China

The top-level framework for green finance has been set up. In August 2016, seven ministries and commissions jointly issued the *Guiding Opinions for Building a Green Financial System* (hereinafter referred to as the *Guiding Opinions*), which marks the establishment of the top-level framework for green finance and makes China become the first of its kind in the world that have established a relatively complete policy system for green finance. The *Guiding Opinions* clarifies the definition of green finance and proposes to establish a multi-level system of green finance by vigorously developing green loans, enhancing the role of the securities market in supporting green investment, launching green development funds, developing green insurance, improving environmental rights and interests trading market, supporting local government initiatives to develop green finance, and promoting international cooperation in green finance. As the PBoC rolled out the *Division of Labor Plan for Implementing the Guiding Opinions for Building a Green Financial System* in 2017, the construction of the green financial system keeps advancing in an orderly manner in China.

Figure 3: China's green finance framework



Source: *Guiding Opinions for Building a Green Financial System*, CIB Institute for Carbon Neutrality and Finance

The establishment of the policy ideas for green financial development under the "dual carbon" goals. To facilitate the realization of the "dual carbon" goals, the PBoC has preliminarily established the policy ideas for green finance, which are characterized by "Three functions" and "Five pillars", so as to adapt to the profound changes in the country's industrial structure, energy structure, investment structure and people's lifestyle in all aspects. Specifically, "Three functions" means: first, giving full play to the role of resource allocation; second, managing risks related to climate change; and third, leveraging the market pricing function, including the function of promoting market pricing of carbon emissions trading under the carbon neutrality constraint. "Five pillars" include: first, improving the standard system for green finance; second, improving the regulation of financial institutions and the requirements for climate and environmental information disclosure; third, establishing a policy incentive and constraint system; fourth, continuously improving green financial products and market systems; fifth, intensifying international cooperation in green finance.

Upgrade of green finance guidelines for banking and insurance institutions. On June 2, 2022, China Banking and Insurance Regulatory Commission (CBIRC) issued the *Green Finance Guidelines for Banking and Insurance Industries* (hereinafter referred to as the *Guidelines*), an effort that is to guide banks and insurance institutions to intensify support for green, low-carbon and circular economies, guard against ESG risks, and improve their own ESG performances. Besides, the *Guidelines* is also designed to clarify the requirements of green finance policies from the aspects of organizational management, policy system and capacity building, management of investment and financing procedures, internal control management and supervision. It is a guiding document for China's banking and insurance institutions to promote green finance in the future. The *Guidelines* has been comprehensively upgraded contrastive the previous *Green Credit Guidelines* issued in 2012, showing five highlights: first, encouraging banking and insurance institutions to develop green finance in an all-round way; second, expand the coverage and enhancing the effectiveness of green financial policies; third, shifting its focus from environmental (E) and social (S) to environmental (E), social (S) and governance (G); fourth, serving the country's efforts to achieve the "dual carbon" goals; fifth, further strengthening information disclosure and interaction with stakeholders.

(2) Continuous improvement of policies in various fields of the green financial system

The improvement of green finance policies and systems in such fields as the standard system, environmental information disclosure system, incentive and constraint mechanisms, product polices and guidelines, plus the deepening of international cooperation in green finance, has made various fields of green finance more standardized, speeding up its pace of development.

First, the standard system for green finance has continued to improve. China intends to build a domestically unified, internationally aligned, clear and workable standard system for green finance. In recent years, with the continuous improvement, the China's green finance standard framework has taken shape, including six categories of standards: basic universal standards for green finance; standards for green financial products and services; standards for credit rating and assessment of green finance; standards for information disclosure of green finance; standards for statistics and sharing of green finance; and standards for risk management and protection of green finance. Among them, the *Green Industry Guidance Catalogue (2019 Edition)* ("*GIGC 2019*"for short), as the basic universal standards for green finance published in 2019, divides green industries into six categories, which include energy-saving and environmental protection industries, clean production industries, clean energy industries, eco-environmental industries, green upgrading of infrastructure, and green services. Currently, this *Catalogue* is the most comprehensive and detailed guide on defining green industries and projects in China. In March 2023, the NDRC published the updated *Green Industry Guidance Catalogue (2023 Edition, exposure draft)*, which was formed by revising the 2019 Catalogue, for month-long public comments. According to the *2023 Catalogue*, the classification structure of the green industry catalogue has been adjusted to be highly consistent with the country's current green development ideas. Moreover, some updates and adjustments have also been made to specific green sub-sectors. As of November 2023, the official version of the *2023 Catalogue* has not yet been released. Furthermore, various green financial product standards, including standards of green loan, green bond, green insurance, and carbon financial product, are also being introduced and will continue to be updated and improved so that they are domestically unified and international compatible.

Second, the environmental information disclosure system for green finance has continued to improve. On July 22, 2021, PBoC released the *Guidelines for Financial Institutions on Environmental Information Disclosure (JR/T 0227-2021)*. As a standard in the financial industry, the *Guidelines* sets forth the requirements for the form and frequency of environmental information disclosure, as well as qualitative and quantitative information to be disclosed. In light of the actual operating characteristics of each financial institution, the *Guidelines* also provides guidance on the measurement and basis of quantitative information for financial sub-sectors such as commercial banks, asset management, insurance, trust, futures and securities. However, it should be noted that this *Guidelines* is a recommended industry standard rather than a mandatory national standard.

Third, the incentive and constraint mechanisms for green finance have continued to improve. In terms of the green finance evaluation system, PBoC issued the *Green Finance Evaluation Plan for Banking Financial Institutions* in 2021, which was made by revising the *Green Credit Performance Evaluation Plan for Banking Depository Financial Institutions (for trial implementation)* rolled out in 2018. The *Green Finance Evaluation Plan* clarifies the implementation principles, business scope, responsible parties and assessment objects, evaluation cycle, data sources, evaluation indicators and methods, the application scenarios of the evaluation results, etc. Among them, the scope of green financial business has expanded to various businesses that comply with green financial standards and relevant regulations, but in current, only green loans and domestic green bonds are evaluated. The evaluation indicators include quantitative and qualitative indicators, with a weight ratio of 4:1; evaluation results will be brought into the PBoC's policies and prudential management tools, such as the central bank rating of financial institutions. In addition, guided by China Banking Regulatory Commission (CBRC), the China Banking Association (CBA) released the *Implementation Plan for Green Bank Evaluation in the Chinese Banking Industry (Trial)* at the end of December 2017, to carry out green bank evaluation on 21 major banks. It came into effect on January 1, 2018. **In terms of monetary policy**, first, PBoC incorporated eligible green credit and bonds into the scope of qualified collateral for monetary policy operations in 2018; second, in 2021, PBOC rolled out structural monetary policy tools, including the carbon reduction supporting tool (to be implemented until the end of 2024), special re-lending for clean and efficient coal use (to be implemented until the end of 2023), and special re-lending for equipment renewal and renovation, to shore up green and low-carbon transformation of the economy.

Fourth, policies and guidelines for green financial products have continued to be enriched and enhanced. In terms of green loan, CBRC issued the *Green Credit Guidelines* to regulate the green credit business of banking financial institutions in 2012, which was upgraded into the *Green Finance Guidelines for Banking and Insurance Industries* in 2022. **In terms of green bonds**, based on different regulatory authorities, China has established a relatively complete policy system for different type of green bonds, including green financial bonds, green corporate bonds, green non-financial corporate debt financing instruments, green asset-backed securities. The policy system also covers the certification, information disclosure, and duration management of green bonds. The latest release of the *China Green Bond Principles* in July 2022 marks the initial standardization of green bond issuance in the country and its alignment with international standards. In addition to green loan and green bonds, the Asset Management Association of China (AMAC), China Trustee Association (CTA), and the Insurance Association of China (IAC) have also released the *Green Investment Guidelines (For Trial Implementation)*, *Green Trust Guidelines*, and the *Green Insurance Classification Guidelines (2023 Edition)* respectively.

Fifth, the international cooperation in green finance has continued to deepen. Firstly, during its presidency of the G20 in 2016, China actively promoted green finance as a mainstream international topic and a global consensus. In 2016, the PBoC made green finance one of G20's fiscal and financial topics for the first time and took the lead in setting up the G20 Green Finance Study Group. In 2021, the Study Group was transformed as the Sustainable Finance Working Group, co-chaired by the PBOC and the US Department of Treasury. In 2021 and 2022, China and the United States took the lead in developing and releasing the *G20 Sustainable Finance Roadmap* and the *G20 Framework for Transition Finance*, respectively. **Secondly, the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) was established to promote green finance cooperation between central banks and supervisors.** In December 2017, central banks and supervisors from eight countries including China jointly established the Network for Greening the Financial System (NGFS) to explore the policy consensus among central banks and supervisors to boost the development of green finance. NGFS pays attention to the impacts of climate change and environmental factors on macro-financial stability and micro-prudential supervision with the aim to beef up risk management of the financial system and mobilize capital for green and low-carbon investments. **Thirdly, green finance is applied to build a green "Belt and Road".** In 2018, China and the UK jointly launched the Green Investment Principles (GIP) for the "Belt and Road", which proposes seven principles for green investment from the strategic, operational and innovative perspectives to facilitate the green and sustainable development of the "Belt and Road". Also, GIP was included in the outcome of the 2019 Belt and Road Forum for International Cooperation. Since its launch, GIP has seen substantial results, including the development of the environmental and climate risk assessment toolbox, the development of the climate and environmental information disclosure framework, and the launch of green project library and research on green supply chain management. Meanwhile, GIP has also received positive responses from the financial industry across the world. With its growing influence, it has become an important platform to promote green finance across the Belt and Road. As of September 2023, GIP has 47 signatories and 18 supporting institutions worldwide. **Fourthly, China worked together with the EU to launch the International Platform on Sustainable Finance (IPSF) to draw up common ground taxonomy for green finance.** In 2019, the PBoC and the EU established the International Platform on Sustainable Finance (IPSF), which released the *Common Ground Taxonomy: Climate Change Mitigation* in 2021 to work toward a "common ground taxonomy" for green finance, lower the cost of identifying green financial products, and promote green cross-border capital flows.

(3) Carrying out pilot zones for speeding up green finance reform and innovation.

In June 2017, with the approval of the State Council, the PBoC worked together with relevant departments to launch a five-year green finance reform and innovation experiment in eight places scattered in five provinces, including Huzhou and Quzhou in Zhejiang Province, Guangzhou in Guangdong Province, Ganjiang New Area in Jiangxi Province, Gui'an New Area in Guizhou Province, and Hami, Changji and Karamay in Xinjiang Autonomous Region. Over the past five years, the eight pilot zones have actively carried out green finance innovation, each with its focus and features. They have achieved good results in formulating and testing green finance standards, improving environmental information disclosure of financial institutions, tightening policy incentives and constraints, innovating green financial products and services, extensively conducting international exchanges. Definitely, they have played a positive role in enhancing the green finance service system, pushing both local and national green finance development and shoring up the green and low-carbon transformation of the economy. In 2018-2021, the average annual growth rate of green loans in the pilot zones stayed at 21.03%, 5.59 percentage points higher than that of all loans in the pilot zones. As of the end of September 2022, the green loans as a percentage of all loans in the pilot zones was 12.58%, which is 2.93 percentage points higher than the national average level. [2]

In November 2019, the green finance reform and innovation experiment was expanded for the first time, with Lanzhou New Area in Gansu Province becoming the ninth pilot zone. In August 2022, Chongqing Municipality was officially approved to build a green finance reform and innovation pilot zone. Meanwhile, the PBoC expressed that the upgrading and expansion of the pilot zones will start in due course. Following the principle of "making overall planning for the eastern, central and western regions, and promoting the coordinated development of the southern and northern regions", the country will select a group of regions that can undertake major reform and innovation tasks and support major national regional development strategies to continuously carry out green finance reform and innovation experiments and make further progress in the development of green finance reform and innovation on all fronts[3].

1.2.3 Climate investment and financing, an important field of green finance

From the introduction of the top-level policy system to the establishment of pilot zones in multiple regions, and then to the release of incentive and constraint policies, climate investment and financing has gradually become one of the main battlefields of green finance.

(1) Introduction of the top-level policy system

On October 26, 2020, five authorities, including the MEE and the NDRC, jointly issued the *Guidance on Promoting Investment and Financing in Response to Climate Change* (Document No. 57 of MEE [2020], hereinafter referred to as the *Guidance*). As the country's first policy paper for climate investment and financing, the *Guidance* clarifies the main goals, definitions and scope of climate investment and financing and provides the top-level design for the sector to guide various resources such as funds, talents, and technologies to enter the field of addressing climate change.

The introduction of the *Guidance* is of landmark significance in guiding and promoting climate investment and financing and helping the country achieve the "dual carbon" goals. The *Guidance* features 15 initiatives in the five aspects of policy system, standard system, fund introduction, local practice and international cooperation. **The first is to speed up the pace of building a policy system for climate investment and financing**, with emphasis on strengthening environmental and economic policy guidance, financial policy support and the coordination of various policies; **the second is to gradually improve the standard system for climate investment and financing**. To this end, it is

[2]Research Group of the Research Bureau of the People's Bank of China. Progress and Experience of Green Finance Reform and Innovation Pilot Zones[J]. China Finance, 2023(6):3.

[3]Same as above.

necessary to make overall planning for the construction of the standard system, the development of standards for climate projects, the improvement of climate information disclosure standards, and the establishment of climate performance evaluation criteria; **the third is to encourage and guide private and foreign capital to enter the climate investment and financing sector.** In this process, it is advisable to stimulate the motivation and vitality of social capital, give full play to the incentives and constraints of carbon emissions trading mechanism, and introduce foreign investment; **the fourth is to guide and support local practices in climate investment and financing**. To this end, it is necessary to construct pilot zones for climate investment and financing, create a favorable policy environment and encourage innovation in development models and tools; and **the fifth is to deepen international cooperation in climate investment and financing.** To this end, positive efforts are needed to boost bilateral and multilateral practical cooperation in climate investment and financing, facilitate the implementation of overseas projects for climate change mitigation and adaptation, regulate those overseas investment and financing activities by financial institutions and enterprises, meanwhile guard against climate risks.

(2) Advancement of local climate investment and financing pilot

The aforementioned *Guidance* explicitly proposes to "carry out local climate investment and financing pilot. In accordance with the State Councils' work plans on regional financial reform, positive efforts should be made to support regional pilot projects for green finance. Those typical regions that are willing to try, can play a leading role, and have good basic conditions should be picked out to carry out climate investment and financing pilot projects with the focus on investment policy guidance and strengthened financial support". On December 24, 2021, nine authorities, including the MEE and the NDRC, jointly issued the *Notice of the Pilot Work on Climate Investment and Financing* (Document No.27 of MEE General Office [2021]), to which was attached the drafted *Climate Investment and Financing Pilot Work Scheme* (hereinafter referred to as the Scheme). This marks the launch of local pilot work on climate investment and financing in the country.

The *Scheme* contains eight major tasks for the climate investment and financing pilot work, including preparing pilot plans, resolutely deterring the haphazard development of projects featuring high energy consumption and emissions, developing carbon finance in an orderly manner, stepping up carbon accounting and information disclosure, reinforcing innovation in models and tools, intensifying policy synergies, building a national database for climate investment and financing projects, and beefing up talents building and international exchanges and cooperation. On August 10, 2022, nine authorities, including the MEE, NDRC and MIIT, jointly unveiled the *Notice on the List of Climate Investment and Financing Pilots*, identifying the first batch of 23 pilot cities and regions for climate investment and financing. At present, the vast majority of pilot areas have begun to promote climate investment and financing. For instance, Beijing's Tongzhou District and Hunan's Xiangtan City have released their regional work plans; more than ten pilot areas, including Shenzhen's Futian District, Wuhan's Wuchang District, and Chuzhou City in Anhui Province, have started to make preparations for the project reserve repository and have launched a number of typical projects in succession. Furthermore, most pilot areas have set up the center, platform or portal website to promote climate investment and financing promotion[4]. In October 2023, Guangzhou Nansha New Area unveiled the *Several Measures to Promote the Development of Climate Investment and Financing in Guangzhou Nansha New Area,* the country's first local special policy to encourage climate investment and financing development. According to the *Measures*, there are a number of supportive policies for climate investment and financing. For example, a settlement reward of maximum RMB 12 million may be granted for each of those enterprises that newly settle in Nansha and are engaged in climate investment and financing.

[4]Source: Round-up of 23 climate investment and financing pilot projects: actions plans come out successively while the construction of project library need to pick up the pace, Southern Finance Omnimedia [EB/OL], 2023/10/18[2023/11/24] https://www.163.com/dy/article/IHBJOD8T05199NPP.html

(3) Introduction of incentive and constraint policies

In November 2021, the PBoC rolled out an innovative structural monetary policy tool- “carbon reduction supporting tool”, to shore up the development in three major areas: clean energy, energy conservation and environmental protection, and carbon reduction technology. The PBoC provides financial support by adopting the "system for direct funds". Financial institutions can apply for the low-cost funding from the PBoC after the loans for carbon reductions are made. The central bank will provide 60 percent of the loan principal to the financial institutions, with a lending rate of 1.75% for one year and a possibility of extension twice. The interest rates of loans provided by financial institutions to firms in key carbon-reduction fields should be basically in line with the benchmark lending rates, or the loan prime rates. In addition, this tool attaches importance to information disclosure to ensure its effectiveness in reducing carbon emissions. When applying for the carbon reduction supporting tool from the central bank, financial institutions need to provide carbon reduction data related to loans for carbon reduction projects; after obtaining support from the central bank, they should disclose the information on the carbon reduction areas supported by policies, loan amounts, weighted average interest rates and carbon reduction data to the public on a quarterly basis, and accept public supervision. The PBoC will also work with relevant departments to verify the authenticity of information disclosed by financial institutions through various methods such as entrusting third-party professional organizations to conduct verification.

2. Inventory of Sustainable Financial Products and Markets in China

After more than a decade of development, China's sustainable financial market has grown, with a wide range of products, such as debt, equity, insurance, green financial technology, cross-border products, etc., making due contribution to the sustainable development in the country.

2.1 Debt products and instruments

2.1.1 Green loan

2.1.1.1 Policies and standards

(1) Business guidelines

In 2012, the CBRC released the *Green Credit Loan Guidelines* (Document No.4 of CBRC [2012]) to guide banking financial institutions in the country to develop green credit loan. According to the *Guidelines*, "Banking financial institutions shall promote green credit loan as a strategy, support economy to grow in a green, low-carbon and circular model through business innovation, manage environmental and social (E&S) risks, improve their own E&S performances, and in doing so to optimize credit structure, improve services and contribute to the transformation of economic pattern." The *Guidelines* makes it clear that when promoting green credit, banking financial institutions need to take into account business development, risk management and their own E&G performances. Also, the *Guidelines* puts forth requirements for banking financial institutions that carry out green credit business from five aspects:

1) Organizational management. The board of directors or council of banking financial institutions should i) promote concepts related to green credit; ii) determine the green credit development strategy and supervise and assess its implementation; iii) set green credit goals; iv) put in place mechanisms and procedures, and clarify responsibilities and authorities.

2) Policy system and capacity building. Banking financial institutions should establish and continuously improve the policies, systems and procedures for E&S risk management, define the direction and key areas of green credit, prepare standards for the evaluation of E&G risks from clients, and enhance capacity building in green credit.

3) Procedure management. Banking financial institutions should step up credit due diligence and approval management and tighten E&S risk management before, during and after lending.

4) Control management and information disclosure. Banking financial institutions should incorporate the

implementation of green credit into the scope of internal control and compliance inspections, put in place an effective assessment system and reward and punishment mechanisms for green credit, publish their strategies and policies related to green credit, and disclose the information on green credit development.

5) Supervision and inspection. Banking financial institutions should establish a sound information-sharing mechanism, improve information services, strengthen their coordination and cooperation with relevant regulating authorities, and carry out a comprehensive assessment of green credit at least once every two years and submit their self-assessment reports to the regulating authorities.

On June 2, 2022, the CBIRC unveiled the *Green Finance Guidelines for Banking and Insurance Industries*, which was made by upgrading the *Green Credit Guidelines* issued in 2012 on all fronts. In this way, the coverage of the *Green Finance Guidelines* has extended from green credit to green finance. Also, it contains new requirements for banking financial institutions to carry out green credit business. For example, in terms of business support, the *Green Finance Guidelines* highlights the role of green finance in serving the country to achieve the carbon peaking and carbon neutrality goals; in terms of risk management, it has expanded its focus from E&S risks to ESG risks; in terms of banking financial institutions' environmental performance, the *Green Finance Guidelines* proposes to reduce the carbon intensity of their asset portfolios in a gradual and orderly manner before achieving the carbon neutrality among asset portfolios. Furthermore, it also emphasizes information disclosure and interaction with stakeholders.

(2) Standards and statistical system

In addition to business guidelines, standards and statistical systems for green credit have also seen continuous improvement.

In 2013, the CBRC published the *Green Credit Loan Statistical System*, clarifying that green loans include: i) project loans supporting 12 types of energy conservation and environmental protection projects and ii) manufacturing loans supporting 3 types of strategic emerging industries. In 2018, the PBOC released the *Special Statistical System for Green Loans*, which separately conducts special statistics on loans issued by financial institutions for energy-saving and environmental protection projects and services（green loans）, and loans to enterprises with major risks on environment and safety. The statistical scope of green loans is consistent with the 12 types of energy conservation and environmental protection loans of *Green Credit Loan Statistical System*, but does not include the 3 types of manufacturing loans, and the statistics adopt a variety of dimensions, including the use of proceeds (UoPs), the industry of the loan recipient, and the quality of loans.

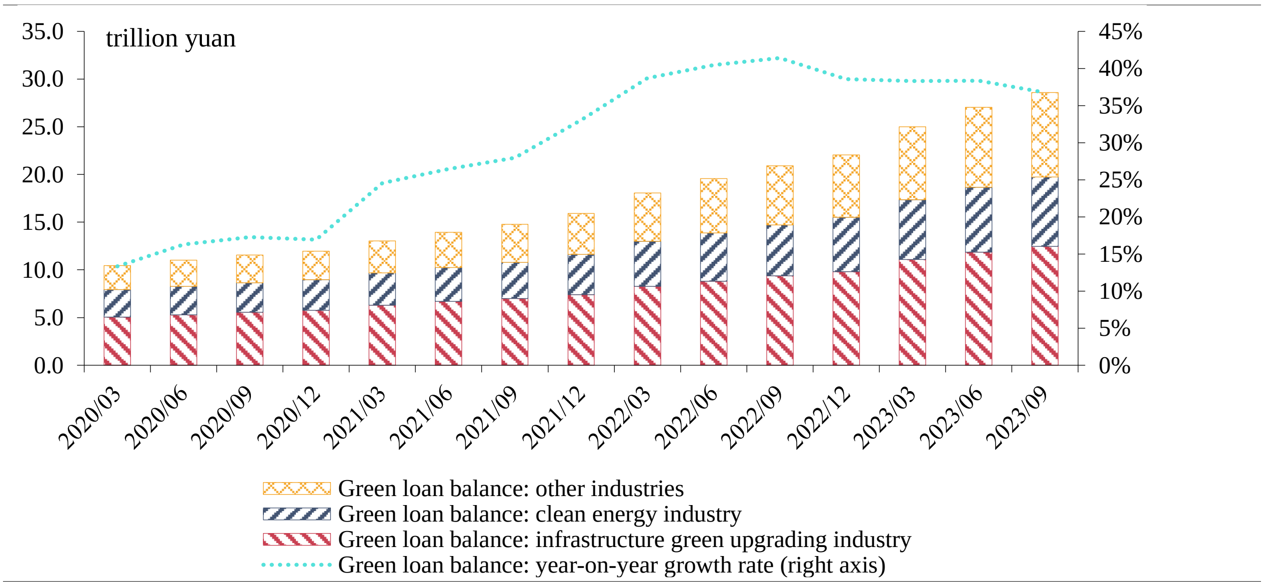
The PBOC and the CBRC improved the standards and statistical system for green loans based on the *GIGC 2019* respectively in 2019 and 2020. The PBOC issued the *Notice on Revising the Special Statistical System for Green Loans* in 2019, which revised the UoPs classification of green loans based on the *GIGC 2019*, expanding the statistical scope of green loans to personal operating loans. In 2020, the CBIRC issued the *Notice of the Work related to the Green Financing Statistical System* which upgraded the scope of the statistical system from green credit loans to green finance. There are two major updates: i) the statistics of green credit loans on the balance sheet have been expanded to covering the whole industry chain. In the statistical system of 2013, CBRC counted green loans support for only terminal green projects. While in the new statistical system of 2020, it expanded to the financing products and services support for the whole industry chain, covering green production, construction, operation, trade and consumption activities, etc. ii) UoPs classification of green financial products were revised to be consistent with *GIGC 2019*, except for several additions, deletions and mergers in some subprojects.

Among the green loan products, climate loan products have received increasing attention. Firstly, in the CBIRC's *Green Financing Statistical System*, separate statistics are conducted on climate investment and financing activities. Secondly, from 2021, the PBOC has separately announced the outstanding loans for projects with both direct and indirect carbon reduction benefits in its quarterly green credit report. Thirdly, the release of *Carbon Financial Products* clarifies the definitions and business processes of three types of carbon financial products, including carbon asset pledge loan. Carbon asset pledge loan refers to a financing contract where the holders of carbon assets (borrowers) use the carbon assets they own as pledge /collateral to obtain loans from fund providers (lenders) and then release the pledge/collateral by repaying the principal and interest at maturity.

2.1.1.2 Market overview

The size of China's green loan has been advancing rapidly, with climate loan becoming the most important component. According to the data from PBOC, China's outstanding green loans in local and foreign currencies was 28.58 trillion Yuan by the end of Q3, 2023, a YoY increase of 36.8%, 26.6 percentage points higher than the growth rate of various loans, and an increase of 6.98 trillion Yuan from the beginning of the year. Specifically, loans for projects with direct and indirect carbon-reduction benefits stood at 9.96 trillion Yuan and 9.14 trillion Yuan respectively, accounting for 66.8% of green loans in total. Since the PBOC began to publish the loan balance data for projects with direct and indirect carbon-reduction benefits in Q1, 2021, its proportion in green loan balance has remained above 66%, indicating that climate loan has become the most important component of green loans in China. What's more, supported by the carbon-reduction supporting tool, various financial institutions have rolled out loans for carbon-emission cuts. As of the first half of 2023, the carbon-reduction supporting tool saw outstanding of 453 billion Yuan. Specifically, it supported financial institutions to issue 750 billion Yuan loans for carbon emission cuts, and drove annual carbon emission reduction to surpass 150 million tons of carbon equivalent[5].

Figure 4: Balance and Growth Rate of Green Loans in China



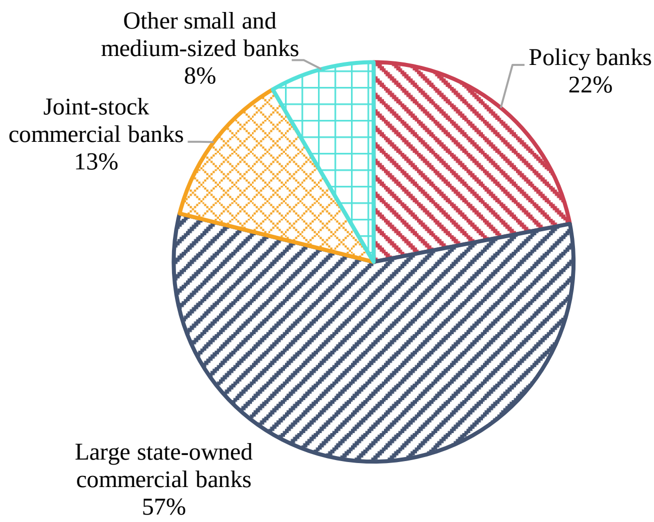
Source: Wind, PBOC, and CIB Institute for Carbon Neutrality and Finance

Major banks lead the development of green loan in China. According to the data disclosed by various types of banks, our preliminary statistical results show that by the end of 2022, outstanding green loans of policy banks, state-owned commercial banks and national joint-stock banks combined to make up about 92% of the total outstanding green loans of banks in China. Specifically, outstanding green loans of state-owned commercial banks accounts for the highest proportion, reaching 57%, which is followed

[5]Source: The NDRC, MOF, PBOC, and SAT jointly held a press conference to introduce the "effects of a combination of macroeconomic policies in promoting high-quality economic development" the NDRC's official website [EB/OL], 2023/8/3 [2023/9/20] https://www.ndrc.gov.cn/xwdt/wszb/dtdjjgzlfz/

by policy banks and joint-stock banks, whose outstanding green loans took up 22% and 13% respectively. The green loan balance in large state-owned commercial banks and joint-stock banks saw a relatively high growth, with a YoY growth rate of over 44% at the end of 2022.

Figure 5: The proportions of green loan balances of various types of banks in China at the end of 2022



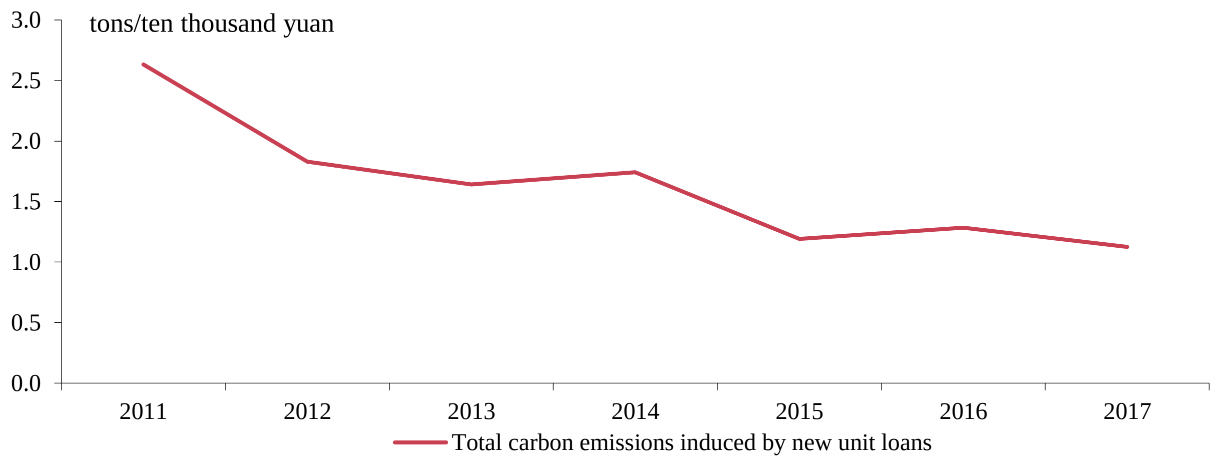
Source: data collected by CIB Institute for Carbon Neutrality and Finance based on the information that have been disclosed.

China's green loan has produced significant environmental benefits. According to the data released by the National Financial Regulatory Administration (NFRA), it is estimates that the green loan support projects of 21 major banks, when completed, are expected to save over 400 million tons of standard coal and reduce the emissions of carbon equivalent by over 1 billion tons every year[6]. In order to measure the comprehensive carbon reduction benefits of various loans issued by China's banking industry, CIB Research developed a comprehensive indicator – credit carbon intensity[7], which means how many units of complete carbon emissions will be generated by each new unit of credit investment. The results show that from 2011 to 2017, the credit carbon intensity of China's banking industry dropped by 57.3% while the carbon emissions per unit of China's GDP only decreased by 31.1% in the corresponding period. It can thus be seen that the banking industry outperformed the overall economic restructuring in promoting green and low-carbon transformation and carbon reduction in the country.

Figure 6: Changes in the Credit Carbon Intensity of the Banking Industry in China, 2011-2017

[6]Source: Vice Minister of NFRA Zhou Liang: providing quality financial services to accelerate the green and low-carbon transition China Economic Net [EB/OL]，2023/9/04[2023/9/15] http://www.ce.cn/xwzx/gnsz/gdxw/202309/04/t20230904_38700274.shtml

[7]Fang Qi, Qian Lihua, and Lu Zhengwei, Banks and China's "Carbon Peaking": construction of overall efficiency indicators for credit carbon reduction [R], CIB Research, 2020.

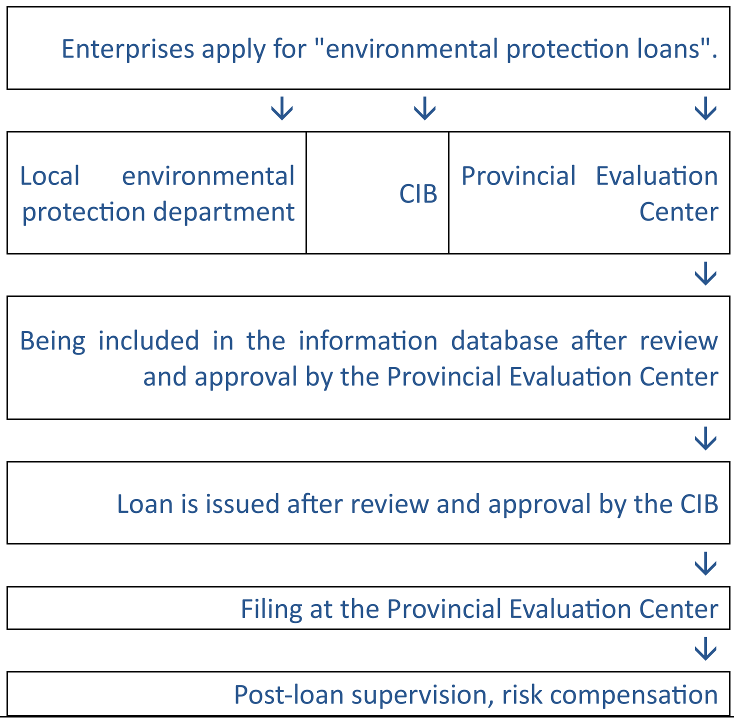


Source: CIB Institute for Carbon Neutrality and Finance

Case: "Environmental Protection Loan" issued in Jiangsu Province

In 2018, Jiangsu Province's Department of Finance, in conjunction with the Department of Ecology and Environment and commercial banks in the province, rolled out a green financial product – "environmental protection loan". The initial investment of 400 million Yuan from the provincial finance authority leveraged bank funds of 8 billion Yuan. Cooperative banks in the first phase included CIB Nanjing Branch, Jiangsu Bank, and CMBC Nanjing Branch. With the financial risk compensation fund pool as a means of credit enhancement, the "environmental protection loan" is designed to guide cooperative banks to lend money to those enterprises engaged in energy-saving and environmental protection projects in the province. When there is a risk of loan repayment, the fund pool and banks will jointly bear the risk consequence according to a differentiated risk sharing ratio. Through this risk sharing method to solve the problems faced by energy-saving and environmental protection enterprises, such as difficulties in lending, significant increase in interest rate, etc.

As for the specific procedures, let's take the cooperation between CIB and local governments as an example:



In 2022, Jiangsu's Department of Finance joined hands with its Department of Ecology and Environment to release the *Work Plan of Jiangsu Province for Environmental Protection Loan Products under the Inclusive Financial Development Risk Compensation Fund*, upgrading the original "environmental protection loan"[8].

Firstly, leverage more funds. Relying on the provincial-level inclusive financial development risk compensation fund which provides credit enhancement and loan risk compensation, the upgraded "environmental protection loan" is able to attract more financial capital to enter the field of ecology and environmental protection.

Secondly, broader scope of support. The new products are designed to crack those hot issues and difficult problems related to environment, increase support for eco-environmental infrastructure construction projects, resource recycling projects, carbon capture, utilization, storage and other carbon reduction projects.

Thirdly, lower cost of enterprise financing. For environmental protection enterprises with a single project loan of less than 10 million Yuan (including 10 million Yuan) and between 10 million Yuan and 30 million Yuan (including 30 million Yuan), the loan interest rate shall not exceed LPR + 50 basis points and LPR + 40 basis points respectively, which is not only a significant decrease from the original LPR +80 basis points, but also lower than the interest rates of similar financial products in the market. In this way, the launch of the new products is to encourage cooperative banks to provide loan support to enterprises mainly in the form of credit, guide cooperative banks to carry out pledge of pollution discharge and carbon emission rights, and abolish charges such as security deposits and financing handling fees.

Fourthly, higher risk compensation. The new products have increased the proportion of loan principal losses borne by the risk compensation fund. When risk compensation occurs for loan projects below 10 million Yuan (including 10 million Yuan), the proportion borne by the risk compensation fund has risen to 80%.

2.1.2 Green, Social and Sustainability Bonds

2.1.2.1 Green bonds

(4) Policies and standards

According to the *Notice on Issuing the Green Bond Endorsed Projects Catalogue (2021 Edition)* (Document No.96 of PBOC [2021]) jointly released by the PBOC, NDRC and the CSRC on April 21, 2021, green bonds refer to marketable securities that are issued in accordance with legal procedures and repay the principal and interest as agreed upon by specifying the proceeds to support green industries, green projects or green economic activities that meet the prescribed conditions. According to competent authorities, China's green bonds can be divided into green financial bonds under the PBOC's supervision, green corporate bonds under the NDRC's supervision[9], green debt financing instruments under the supervision of the National Association of Financial Market Institutional Investors (NAFMII), and green asset-backed securities (including credit ABS under the CBIRC's supervision, asset-backed notes under the NAFMII's supervision, and corporate ABS under the CSRC's supervision). Besides, in recent years, China has also seen the emergence of some innovative green bond sub-varieties, such as carbon neutrality bonds and blue bonds.

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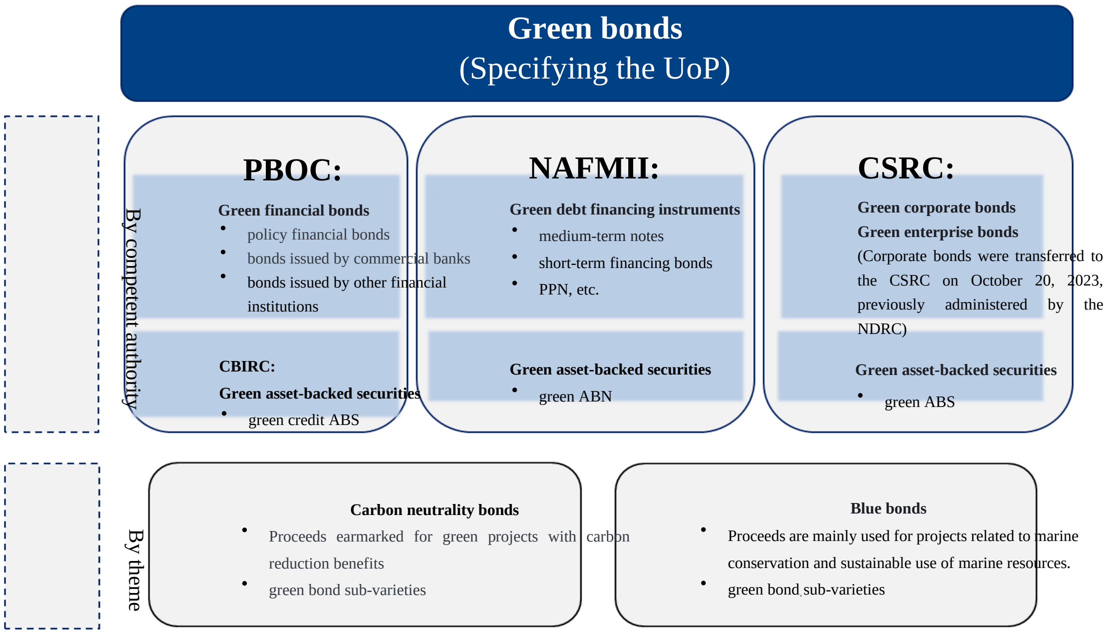
[8]Source: Provincial finance authority innovates and improves the "environmental protection loan" policy to promote high-quality development of the ecological environment, official website of Jiangsu Provincial Finance Department [EB/OL], 2022/5/17[2023/2/28] http://czt.jiangsu.gov.cn/art/2022/5/17/art_7938_10452321.html

[9] Corporate bonds were transferred to the CSRC on October 20, 2023.

Figure 7: Classification of Green Bonds in China



Source: CIB Institute for Carbon Neutrality and Finance

According to different regulatory authorities, China has established a relatively complete policy system for different type of green bonds, including green financial bonds, green corporate bonds, green non-financial corporate debt financing instruments, green asset-backed securities. The policy system also covers the certification, information disclosure, and duration management of green bonds.

Table 3: Policies and systems for green bonds in China

Overview of Green Bond Policies and Guidelines					
Policy Type		Date of Issuance	Regulatory Authority	Policy Document	Main Content
standards and guidelines of various types green bond	green financial bonds	2015.12	PBOC	*Notice No.39 of PBOC [2015]; Green Bond Endorsed Projects Catalogue*	It features guiding opinions and regulatory requirements for the development of green financial bonds from such aspects as how to define green industry projects, where the proceeds to go, fund management during project duration, information disclosure and evaluation or certification by independent institutions, thus providing institutional guidelines for financial institutions to issue green bonds.
	green enterprise bonds	2015.12	NDRC	*Guidelines for the Issuance of Green Bonds*	The Guidelines clarifies the scope and focus supported by green enterprise bonds, as well as the requirements for

					enterprises applying to issue green enterprise bonds.
	green corporate bonds	2016.3	SSE	*Circular on Launching Pilot Program for Green Corporate Bonds*	With SSE and SZSE launching the pilot projects for green corporate bonds in succession, green corporate bonds have gained access to the stock exchanges.
		2016.4	SZSE	*Circular on Launching Pilot Program for Green Corporate Bond Business*	
		2017.3	CSRC	*Guiding Opinions on Supporting the Development of Green Bonds*	The Guiding Opinions defines green corporate bonds and green industry projects. The issuance of such products as green asset-backed securities, green local government bonds, and green renewable bonds shall be based on relevant requirements for green corporate bonds.
	Green debt financing instruments for non-financial enterprises	2017.3	NAFMII:	*Business Guidelines for Green Debt Financing Instruments for Non-Financial Enterprises*	The Business Guidelines features provisions on green debt financing instruments for non-financial enterprise not previously mentioned in other guiding documents for the development of green bonds.
		2019.5	PBOC	*Notice on Supporting the Issuance of Green Debt Financing Instruments in the Green Finance Reform and Innovation Pilot Zones*	The Notice makes clear the definition of green debt financing instruments and the scope of the pilot zone for green finance reform and innovation, and puts forth five specific measures to support the issuance of green debt financing instruments, including exploring and expanding the use of proceeds (UoP).
	Various green bonds	2021.4	PBOC, NDRC, and CSRC	*Circular on the Release of Green Bond Endorsed Projects Catalogue (2021 Edition)*	Based on the *Green Industry Guidance Catalogue (2019 Edition)*, the Circular updates the standards for various types of green bonds, removes items related to the clean utilization of fossil energy, and adopts the internationally recognized principle of "no significant harm

					to the environment" to align with international standards.
		2022.7	China Green Bond Standard Committee (CGBSC)	*China Green Bond Principles*	The Principles basically standardizes the issuance of various types of green bonds in China and clarifies four factors vital to green bonds. Among the four, the most important one is that 100% of green bond proceeds shall be used for green industries, green economic activities, and other relevant green projects that meet the prescribed conditions.
Duration management system		2018.2	PBOC	*Notice on Issues Concerning Strengthening the Supervision and Administration of Green Financial Bonds in the Duration*	The Notice proposes to tighten the supervision and inspection of the use of proceeds in the duration of green financial bonds, in particular inspecting the issuer's operation status, authenticity and progress of UoP, compliance of the screening and decision-making procedures for green projects, and the realization of environmental benefits.
				Regulation on the Disclosure of Information on Green Financial Bonds in the Duration	The Regulations requires issuers to disclose the utilization of proceeds from green financial bonds on a quarterly basis and publish the annual report at the end of the year.
Evaluation and certification mechanisms		2017.12	PBOC, CSRC	*Guidelines for the Assessment and Certification of Green Bonds (Interim)*	The Guidelines contains the regulatory requirements of green bond assessment and inspection institutions, as well as the requirements for their qualifications, assessment or certification procedures, publication of assessment conclusions, and issuance of reports. The assessment and inspection institutions shall conduct pre-issuance review and post-issuance follow-up of

				green bonds in accordance with domestic or international standards recognized by the CGBSC.
	2023.7	PBOC	Guidelines for Green Bond Credit Rating (JR/T 0280-2023)	As an important part of the green financial standard system, the Guidelines incorporates the impact of ESG factors on enterprises' debt-service ability and willingness into the credit rating process, and clearly defines due diligence, information disclosure, and conflicts of interest in green bond rating, providing strong support for credit rating agencies to carry out green bond credit rating business.

Source: CIB Institute for Carbon Neutrality and Finance

The standards and management regulations for green bonds in China have become gradually unified and compatible with international standards.

In terms of green bond standards, the PBOC, NDRC and the CSRC jointly unveiled the *Green Bond Endorsed Projects Catalogue (2021 Edition)* (hereinafter referred to as the *Catalogue of Green Bonds 2021*), which came into effect from July 1, 2021 onwards. The *Catalogue of Green Bonds 2021* has three main features:

1) Its framework are consistent with the *GIGC 2019*. The first-level classification consists of six sectors: energy-saving and environmental protection, clean production, ecological environment, green upgrading of infrastructure, and green services. The third-level classification has been refined, and the fourth-level classification has been added.

2) It has unified the green bond standards in the country, covering all types of green bonds, including but not limited to green financial bonds, green enterprise bonds, green corporate bonds, green debt financing instruments and green asset-backed securities. That is say, it has put an end to the situation in which there exist different green bond standards, which is a boon for the further development of China's green bond market.

3) It is compatible with international standards. The *Catalogue of Green Bonds 2021* has removed those items related to clean utilization of fossil energy and adopted the internationally recognized principle of "no significant harm to the environment", thus becoming compatible with international standards. This can help attract foreign investors to invest in China's green bond market and enhance the country's international discourse and influence in the field of green bond standards.

In terms of management regulations, on July 29, 2022, with the consent of the PBOC and CRSC, the CGBSC unveiled the *China Green Bond Principles*, which is a self-regulated framework for stakeholders' reference to best practice of the green bond market. On the one hand, the *Principles* has basically unified the domestic norms on the issuance of green bonds; on the other hand, it has aligned with international standards, referring to the *Green Bond Principles (GBP)* issued by the ICMA. The *Principles* clarified four core factors of green bonds: i) use of proceeds (UoPs), ii) project evaluation and selection, iii) proceeds management, iv)information disclosure in the duration. Among the four, the most important one is that 100% of green bond proceeds shall be used for green industries, green economic activities, and other relevant green projects that meet the prescribed conditions so as to well comply with relevant international requirements.

(5) Market overview

The cumulate issuance of onshore labelled green bonds in China has exceeded 3 trillion Yuan. According to Wind database, by the end of September 2023, the cumulative issuance of China's onshore labelled green bonds reached 3.28 trillion Yuan, with 1.89 trillion Yuan outstanding. The structure of this is shown in Figure 11-12 below. From the perspective of annual issuance trends of green bonds in China, it has continued to grow since 2021. The issuance throughout 2022 amounted to 873.383 billion Yuan, a YoY increase of 43.6%. The new issuance in the first three quarters of 2023 stood at 643.597 billion Yuan, a slight increase of 3.7% compared to the same period in 2022.

Figure 8: Structure of China's cumulative issuance of onshore green bonds

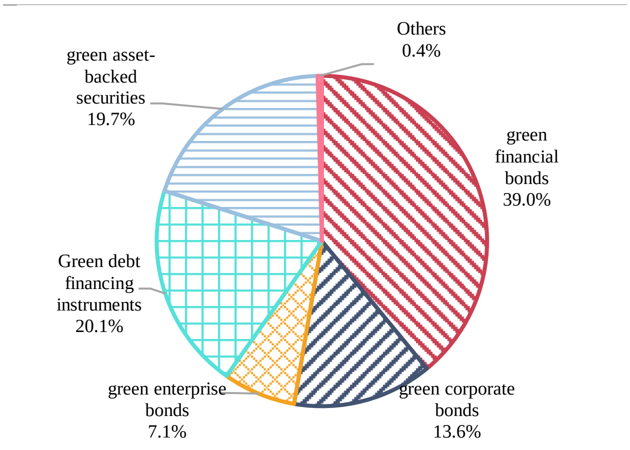
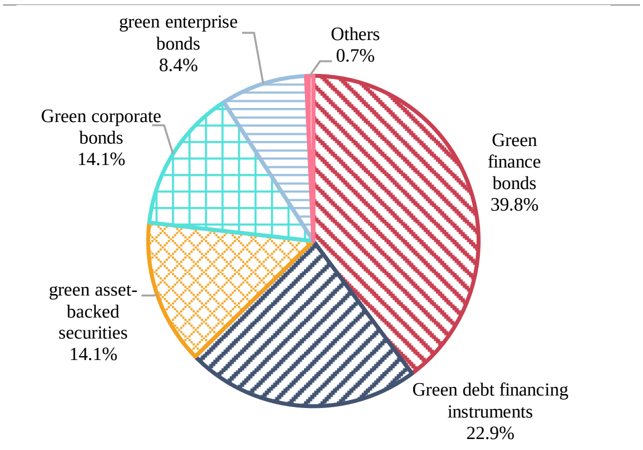
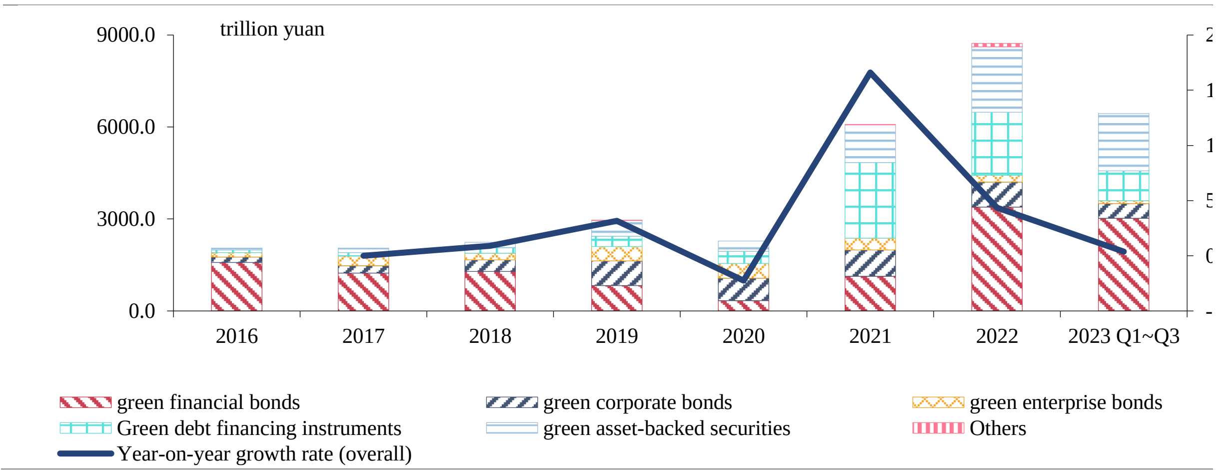


Figure 9: Structure of China's onshore green bonds in stock



Note: Statistics as of the end of September 2023
Source: Wind, CIB Institute for Carbon Neutrality and Finance

Figure 10: Annual issuance and growth rate of China's onshore labelled green bonds



Source: Wind, CIB Institute for Carbon Neutrality and Finance

Carbon neutrality bonds have become the most eye-catching innovative sub-variety in China's green bond market in recent years. The NAFMII and stock exchanges successively launched carbon neutrality bonds in 2021. As an innovative sub-variety of green bonds, the proceeds of carbon neutrality bond are designated to green projects with carbon reduction benefits. Moreover, the issuers of carbon neutrality bonds are required to step up the disclosure of information related to carbon neutrality projects, especially the methodology and reference basis for the measurement of environmental benefits. Also, they should quantitatively measure the environmental benefits, including energy saving (calculated by standard coal) and carbon reduction for the project in accordance with the "calculable, verifiable and testable" principle. By the end of September 2023, the cumulative issuance of China's onshore carbon neutrality bonds hit 624.11 billion Yuan.

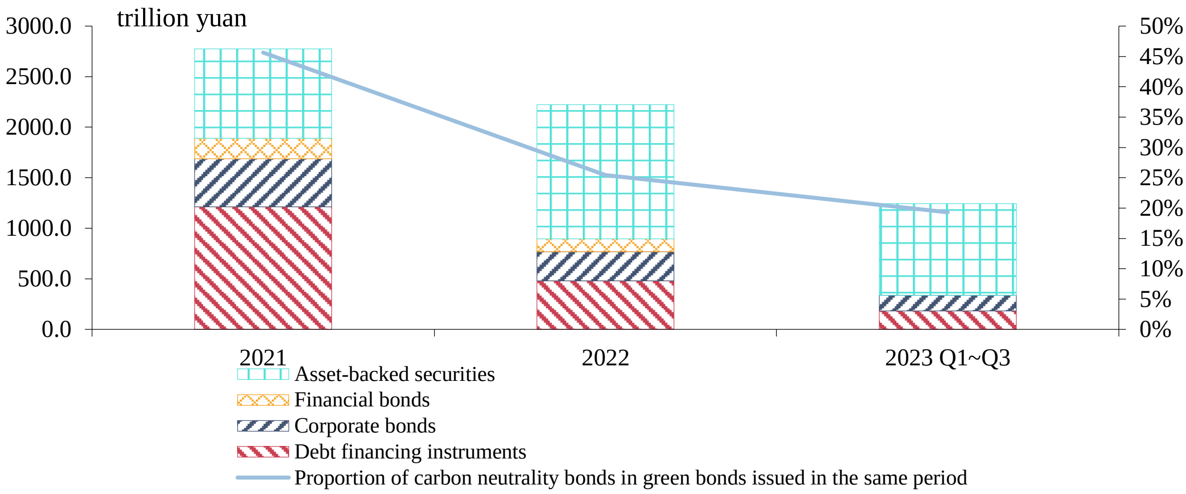
Table 4: Types of projects supported by carbon neutrality bonds

Types of projects supported by carbon neutrality bonds	
(i) Clean energy	Including projects for the development and utilization of hydropower, wind energy, nuclear energy, solar energy, biomass energy, geothermal energy, shallow geothermal energy, and ocean energy.
(ii) Clean transportation	Including projects for urban rail transit, electrified freight rail, replacement of electric buses, and construction of new energy vehicle charging facilities.
(iii) Sustainable building	Including projects related to green buildings, ultra-low-energy buildings, and energy-saving renovation of existing buildings.
(iv) Industrial low-carbon transformation	Including projects for carbon capture, utilization and sequestration, industrial energy efficiency improvement, electrification transformation and high-carbon transformation and upgrading.
(v) Other projects with carbon reduction benefits	/

Source: SZE[10], CIB Institute for Carbon Neutrality and Finance

[10]Source: the notice of The SSE's No.2 Guidelines for the Application of Rules for Review and Examination of the Issuance of Corporate Bonds - Special Corporate Bonds, the official website of the Shanghai Stock Exchange [EB/OL], 2023/10/20[2023/11/20] http://www.sse.com.cn/lawandrules/sselawsrules/bond/review/c/c_20231020_5727823.shtml

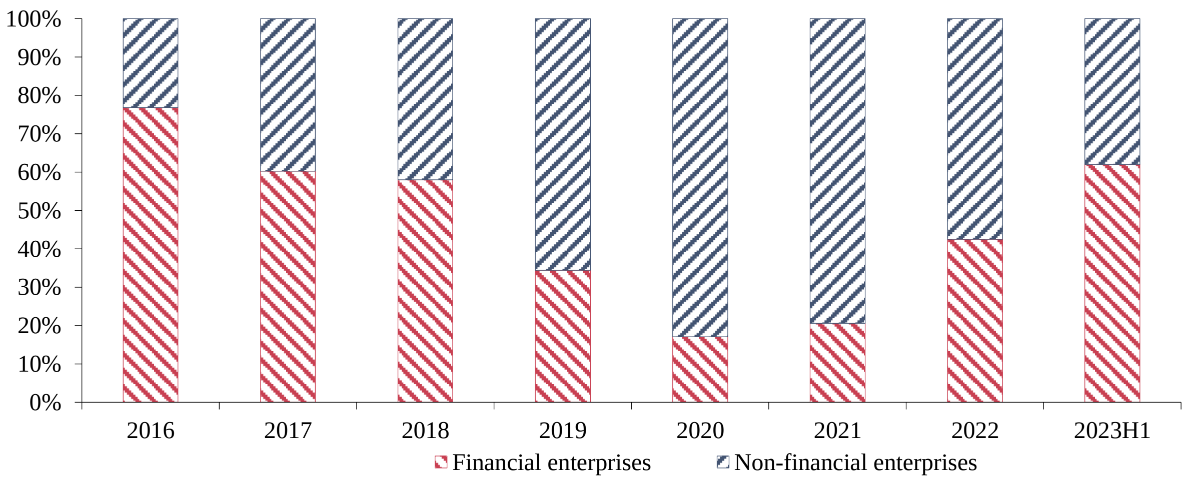
Figure 11: Issuance of carbon neutrality bonds in China



Source: Wind, and CIB Institute for Carbon Neutrality and Finance

Issuer type: the annual issuances of financial institutions have regained their dominance. From 2019, the green bond issuance of non-financial institutions has exceeded that of financial institutions, with the proportion in 2020 once beyond 80%. Since 2021, with the rebound of green financial bond market, the proportion of green bonds issued by financial institutions has increased slightly. In the first half of 2023, financial institutions regained their dominant position with a 62.01% share of green bond issuance. **Among the non-financial issuers, (excluding green asset-backed securities), the issuances from enterprises in the power and transportation sectors are the largest,** totaling 342.135 billion Yuan and 209.714 billion Yuan as of the end of June 2023, respectively.

Figure 12: Proportions of green bonds issued by different types of enterprises in China

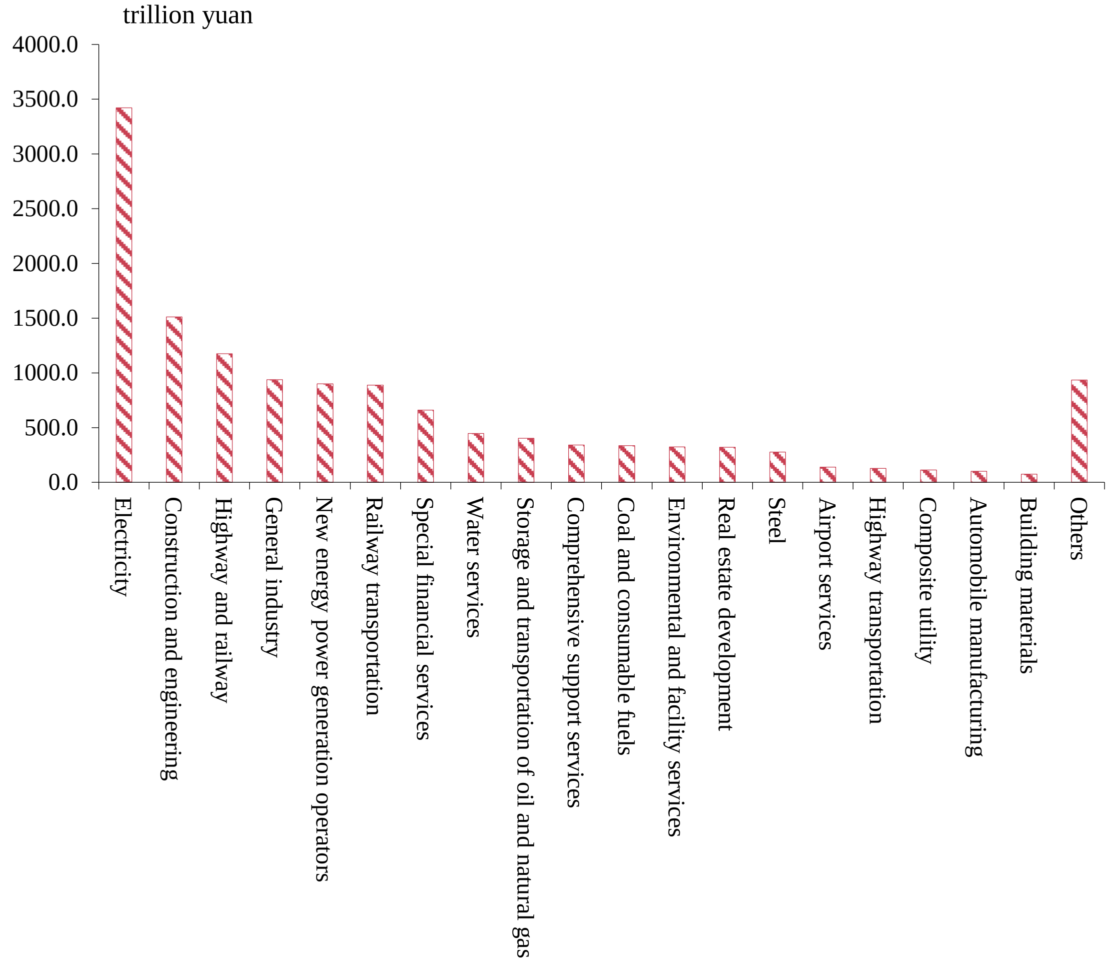


Source: Wind, and CIB Institute for Carbon Neutrality and Finance

Distribution of non-financial issuers by industries: as of the end of September 2023, China's non-financial green bond (excluding green ABS) issuers are mainly distributed in the sectors of electricity (536.397 billion Yuan), construction and engineering (200.235 billion Yuan), general industry (117.076

billion Yuan), highway and railway (107.497 billion Yuan), and new energy power generation[11] (96.535 billion Yuan) .

Figure 13: Distribution of green non-financial bond issuers by sector



Note: Statistics as of the end of September 2023; the industry classification standard is Wind's 4-level industry classification, and some industries have been consolidated.
Source: Wind, and CIB Institute for Carbon Neutrality and Finance

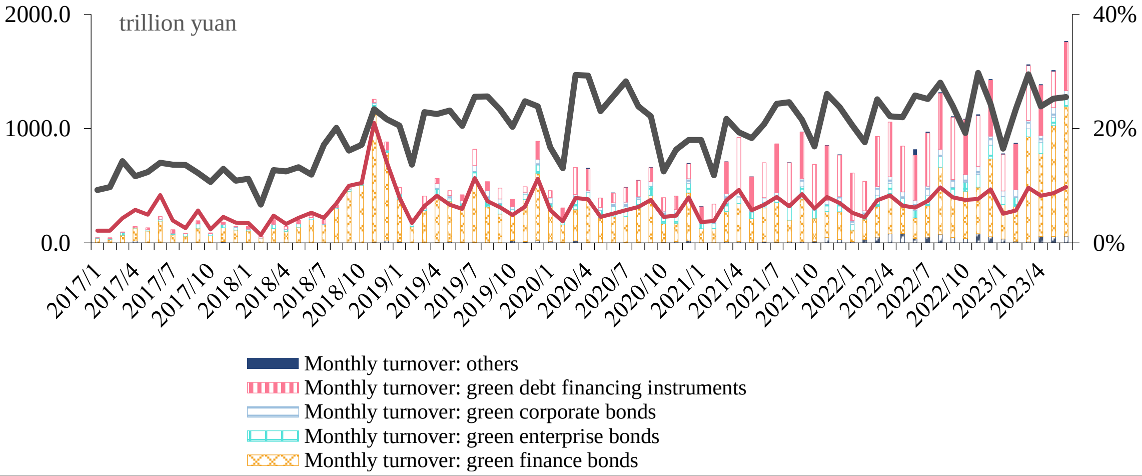
Green bonds have certain cost advantages in issuance. We compare the interest rates of China's onshore green bonds and general bonds (other issuance terms are the same, hereinafter referred to as "comparable bonds") issued in the first three quarters of 2023. Out of the 259 green bonds that comparable bonds are available, 58% were issued at a lower interest rate than comparable bonds, 75bp lower on average. Lower interest rates may attract green bond issuers, but they fail to attract investors with higher requirements for returns.

The liquidity in the secondary market of China's green bond is low. In the first half of 2018 and before, the liquidity was at a lower level. In the second half of 2018, the liquidity increased remarkably. In 2019, it fell back slightly, but with the average monthly liquidity still higher than the 2017 level. The monthly turnover rates of green bonds are generally lower than those of full-faith-and-credit bonds and policy

[11]Note: independent power producers (IPPs) engaged in new energy generation, as distinguished from companies in the integrated power industry.

bank financial bonds. From 2019 to the first half of 2023, the average monthly turnover rate of green bonds was 6.91%, which is much lower than that of full-faith-and-credit bonds and policy bank financial bonds (22.23%) but has increased slightly from the period prior to 2018.

Figure 14: Trading volume and turnover rate of green bonds



Source: Wind, and CIB Institute for Carbon Neutrality and Finance

2.1.2.2 Social responsibility and sustainability bonds[12]

In addition to green bonds, China has also issued a series of onshore special bonds focusing on the themes of social responsibility and sustainable development, including social undertaking bonds, COVID bonds, regional development bonds (such as special bonds for poverty alleviation, rural revitalization bonds and bonds for revitalization of the old revolutionary base areas), bail-in bonds, and sustainability bonds.

Social undertaking bonds are special bonds issued by China's local governments to promote health, education, elderly care, cultural tourism, and other social undertakings. As of the end of September 2023, the issuance of social undertaking bonds reached 873.591 billion Yuan.

COVID bonds were launched after the outbreak of COVID-19 in early 2020 to promote pandemic prevention and control and economic recovery. China issued 1 trillion Yuan special anti-pandemic bonds in 2020. Meanwhile, the PBOC, Ministry of Finance, CBIRC, CSRC, State Administration of Foreign Exchange (SAFE), and NAFMII announced to establish a green channel for the issuance of bonds for fighting against COVID-19. By the end of September 2023, a total of 1.55 trillion Yuan bonds were issued for prevention and control of COVID-19.

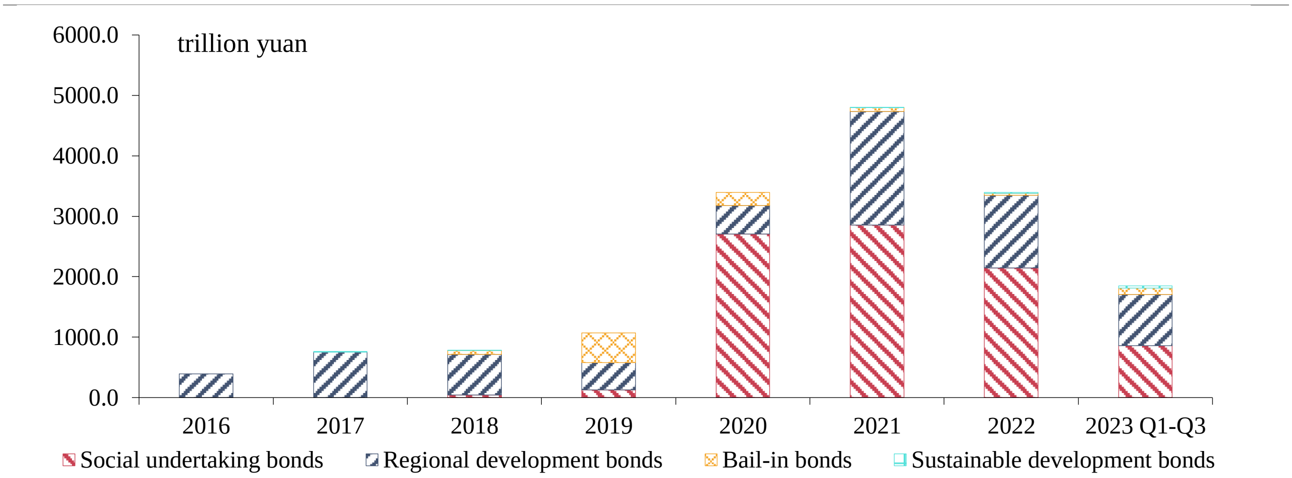
Regional development bonds include special bonds for poverty alleviation, rural revitalization bonds, and bonds for revitalization of the old revolutionary base areas. Among them, **poverty alleviation bonds** were rolled out by various departments to shore up efforts in poverty reduction. They began to develop after the PBOC and other six authorities jointly unveiled the *Implementation Opinions of Financial Assistance in Poverty Alleviation* in 2016. As the country achieved the goal of eliminating extreme poverty and began to promote the rural revitalization strategy on all fronts in 2020, the poverty alleviation bonds have gradually stepped down from the stage of history. Starting from 2021, the NAFMII and stock exchanges have successively rolled out **rural revitalization bonds** to raise funds

[12]Note: China has not launched labelled social responsibility bonds. However, the bonds that have been issued in the country, such as social undertaking bonds, COVID bonds, rural revitalization bonds, and special bonds for poverty alleviation, have all had their proceeds invested in social responsibility areas. This report therefore puts them all under the category of social responsibility bonds, as explained herein.

for consolidating achievements in poverty alleviation, boosting the development of those areas that have been lifted out of poverty, and facilitating rural revitalization comprehensively. **Bonds for revitalization of the old revolutionary base areas** mainly refer to the revitalization-related bonds in accordance with the *Opinions of the State Council on Supporting the Revitalization and Development of Old Revolutionary Base Areas in the New Era*. As of the end of September 2023, the total issuance of regional development bonds reached 667.666 billion Yuan.

Bail-in bonds are designed to help those listed companies and their shareholders facing liquidity difficulties to raise funds, or alleviate financing and liquidity difficulties for private firms and small and medium-sized enterprises. By the end of September 2023, the issuance of bail-in bonds amounted to 96.173 billion Yuan. The issuance of other sustainable bonds totaled 7.311 billion Yuan.

Figure 15: Annual issuances of various types of social and sustainability bonds in China



Source: Wind, and CIB Institute for Carbon Neutrality and Finance

2.1.3 Transition finance products

2.1.3.1 Transition-themed bonds

(6) Policies and standards

Currently, domestic and international transition-themed bonds mainly include two categories. The first category is sustainability-linked bonds (SLBs) that do not specify the use of proceeds (UoP) and whose terms are linked to sustainable development-related goals. The second category is transition bonds that specify the UoP to be earmarked for specific transition activities or projects.

China has continued to innovate with transition-themed bonds over the past two years. In 2021, NAFMII launched SLB. In 2022, the Shanghai Stock Exchange (SSE) and NAFMII launched low-carbon transition bonds (LCTBs), low-carbon transition-linked bonds (LCTLBs) and piloting transition bonds, respectively. Among them, SLBs and LCTLBs belong to the first category of transition-themed bonds mentioned above, and there is no special requirement for their UoP; LCTBs and piloting transition bonds belong to the second category, and both require that the UoP to be earmarked for low-carbon transition.

Table 5: Requirements related to transition-themed bonds in China

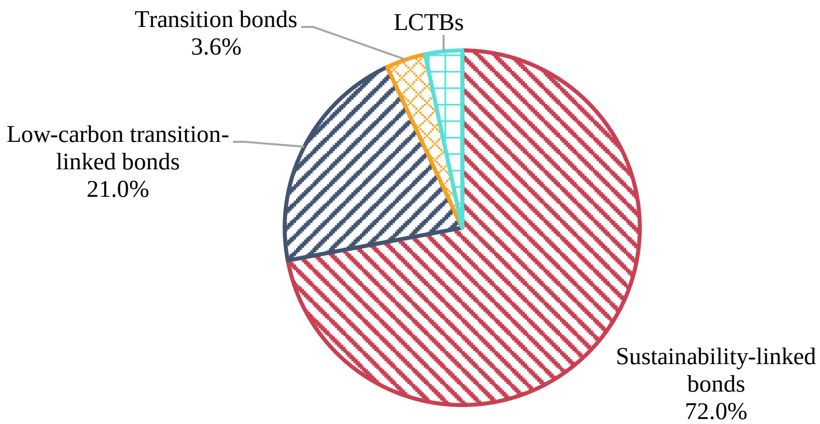
<table>
<tr><th>Transition bond instruments</th><th>Definition</th><th colspan="2">UoP</th></tr>
<tr><td>SLBs (launched by NAFMII)</td><td>SLBs are debt financing instruments that link the terms of bonds to the sustainability goals of the issuers</td><td colspan="2" rowspan="2">General purpose, no special requirements</td></tr>
<tr><td>LCTLBs (launched by SSE)</td><td>Corporate bonds that link the terms of bonds to the low-carbon transition goals of the issuers</td></tr>
<tr><td>Piloting transition bonds (launched by NAFMII)</td><td>Debt financing instruments that raise funds to finance low-carbon transition to support and adapt to environmental improvements and address climate change.</td><td rowspan="2">Specifying the UoP</td><td>Earmarked for low-carbon transition of enterprises, with focus on transforming and upgrading traditional industries. Pilot sectors include electric power, building materials, steel, non-ferrous metals, petrochemicals, chemicals, paper and civil aviation</td></tr>
<tr><td>LCTBs (launched by SSE)</td><td>Corporate bonds that raise funds to finance green and low-carbon transition of enterprises</td><td>According to the national development plan or policy documents related to low-carbon transition and the requirements of national industrial policies, the amount of funds for low-carbon transition purposes should generally not be less than 70% of the total amount of funds raised</td></tr>
</table>

Source: data collected by CIB Institute for Carbon Neutrality and Finance based on the information that have been disclosed.

(7) Overview of the transition-themed bond market

The cumulative issuance amount of China's transition-themed bonds has exceeded RMB 140 billion. As of the end of September 2023, a total of RMB 142.34 billion of labeled transition bonds were cumulatively issued in China's domestic market. Specifically, a total of RMB 102.55 billion, RMB 29.89 billion, RMB 5.13 billion and RMB 4.77 billion of SLBs, LCTLBs, piloting transition bonds (NAFMII) and LCTBs were cumulatively issued, respectively.

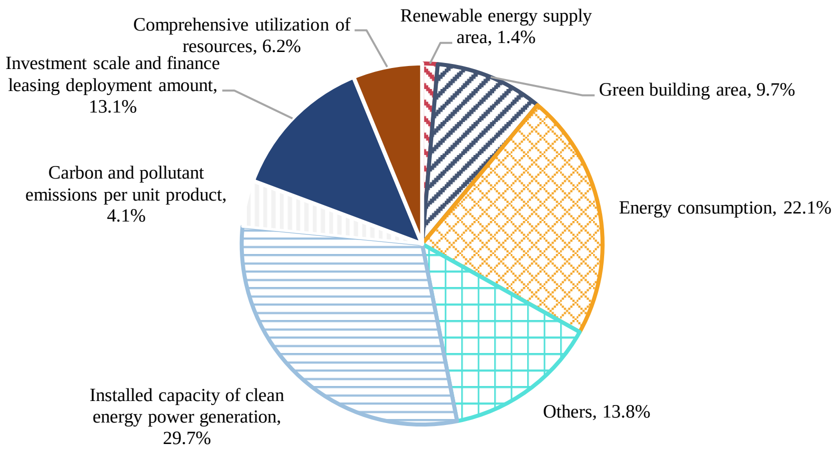
Figure 16: Percentage of cumulative issuance amount of transition-themed bonds in China's domestic market as of September 2023



Source: Wind, and CIB Institute for Carbon Neutrality and Finance

SLBs and LCTLBs are currently the main transition-themed bonds in China, both of which belong to the sustainable development-linked bonds, with their combined issuance amount accounting for more than 90% of the total of transition-themed bonds. **In terms of the setting of linked key performance indicators (KPIs)**, the scale of clean energy installation and energy efficiency are the most common linked KPIs. As of the end of September 2023, of the 172 SLBs and LCTLBs issued in China's domestic market, 29.7% were linked to KPIs related to the scale of clean energy installation, while 22.1% were linked to KPIs related to energy consumption, with energy efficiency improvement as their target. **In terms of bond structure design**, both the SLBs and LCTLBs are designed to adjust the coupon rate or for early redemption based on achievement of linked KPIs, with 90% of the bonds designed to adjust the coupon rate based on achievement of linked KPIs.

Figure 17: Percentage of KPIs set for SLBs and LCTLBs



Source: Wind, and CIB Institute for Carbon Neutrality and Finance

The number and size of LCTBs and transition bonds issued in China remain small. In terms of the UoP, both the LCTBs and transition bonds require the funds raised to be used primarily in low-carbon transition. In this regard, SSE has proposed five major areas of low-carbon transition for the UoP of LCTBs; NAFMII's piloting transition bonds cover eight sectors, i.e. electric power, building materials, steel, non-ferrous metals, petrochemicals, chemicals, paper and civil aviation. The specific UoP include two major categories of low-carbon transition projects and economic activities: 1) projects that have been included in the *Green Bond Endorsed Projects Catalogue (2021 Edition)*, but whose technical indicators have not yet been met, and 2) projects and other related economic activities that are compatible with the carbon peaking and carbon neutrality targets, and that have the effect of reducing pollution and carbon emissions, and improving energy efficiency. The editors conducted preliminary statistics based on the information disclosed in the prospectus of the currently issued LCTBs and transition bonds, and the results show that, as of the end of September 2023, the three largest areas in which the funds raised from LCTBs and transition bonds in China were used were cleaner production and efficient utilization of coal, cleaner energy use of natural gas, and energy-saving & low-carbon retrofits of the steel industry, which together accounted for nearly 80% of the funds raised.

Case 1: The first LCTLB in the cement sector was successfully issued

On July 19, 2022, Huaxin Cement Co., Ltd. successfully issued the first LCTLB in the cement sector on the SSE. The LCTLB was issued in two varieties with a total size of RMB 900 million: i) a 3-year bond worth RMB 500 million at a coupon rate of 2.99%, and ii) a 5-year bond worth RMB 400 million at a coupon rate of 3.39%. Investors subscribed enthusiastically, with 21 participating institutions, and both varieties of bonds set the lowest interest rate for corporate bonds of the same maturity in the cement sector[13].

With Huaxin Cement's carbon emissions per unit of clinker as the linked KPI, it is the first bond in China's SLB and LCTLB market directly selecting carbon emission-related indicators as the linked KPIs. With a KPI of reducing carbon emissions per unit of clinker to 829.63kgCO_2/t by the end of 2024 (the baseline is 845.80kgCO_2/t per unit of clinker by the end of 2021), a coupon rate adjustment mechanism was set up to link the coupon rate in the last interest-bearing year of the base term to the degree of achievement of the KPI, and failure to meet the KPI will cause the coupon rate in the last interest-bearing year to increase by 10BP.

In terms of third-party verification, Huaxin Cement engaged an independent third-party assessment and verification organization to independently assess and verify the selection of the KPIs, the performance results of the low-carbon transition performance targets, the low-carbon transition benefits that can be achieved at the corresponding time and the baseline data of the selected KPIs prior to the issuance of the bond, to ensure that the selected KPIs are in line with the development objectives of low-carbon transition of the cement sector and the company. During the life of the bond, the third-party organization will track and assess the KPIs selected, the low-carbon transition performance targets, the impact on the financial/or structural characteristics of the bond, and the achievement of KPIs. In addition, the third-party organization will issue a verification report by April 30, 2025, verifying the final achievement of the low-carbon transition performance targets.

Case 2: The first adaptation-themed SLB was successfully issued

On October 17, 2023, Fuzhou Water Group Co., Ltd (hereinafter referred to as "Fuzhou Water") successfully issued China's first adaptation-themed SLB on the Shenzhen Stock Exchange (SZSE). The 3-year SLB was issued with a size of RMB 500 million. Investors subscribed enthusiastically on the day of book-entry, with a full subscription rate of 3.50 times and a final coupon rate of 3.09%, a record low issuance rate for AA+ corporate bonds in Fujian Province since 2023[14].

The KPI selected is "increasing raw water supply capacity to adapt to climate change", and failure to meet the target value of raw water supply in FY2025 would be subject to an additional 0.10% of the principal amount at maturity, in addition to the normal principal amount.

By increasing the raw water supply capacity, it can not only improve the spatial allocation of water resources and emergency response capacity of the receiving area and fully implement the safe water supply from dual water sources, but also enhance the water supply security guarantee capacity of

[13]Source: Huaxin Successfully Issues Industry's First Low-Carbon Transition-Linked Corporate Bond, Huaxin Cement website, 2022/7/20[2023/1/28] https://www.huaxincem.com/view/5322.html

[14]Source: Guotai Junan Completes Domestic First Adaptation-Themed and Fujian Province's First Non-Financial Corporation Sustainability-Linked Corporate Bonds,WWW.CFBOND.COM[EB/OL], 2023/10/23 [2023/11/20] https://baijiahao.baidu.com/s?id=1780528622901079985&wfr=spider&for=pc

the receiving area. It is a typical application practice of green finance in adaptation, and also the first adaptation themed SLB in China.

2.1.3.2

2.1.3.3 Sustainability-linked loans (SLLs)

Innovation in SLLs continues. SLLs incentivize borrowers to achieve sustainability goals by linking the terms of the loan (typically the interest rate on the loan) to the achievement of the pre-defined sustainability performance indicators. Since the Loan Market Association (LMA), Asia Pacific Loan Market Association (APLMA) and Loan Syndications and Trading Association (LSTA) jointly released the *Sustainability Linked Loan Principles* in March 2019, SLLs has been developing rapidly globally, and China has also been actively developing innovative SLLs, with a number of banks having introduced SLLs. For example, in 2022, CIB Wuhan Branch successfully issued the first SLL in Hubei, providing RMB 30 million of medium- and long-term financial support for a chemical group in Xiangyang. The SLL links the loan interest rate to the chemical group's predefined performance targets, i.e. the amount of phosphogypsum for comprehensive utilization and carbon emission reductions, and the achievement of any of the set targets would result in a 10BP reduction in the loan interest rate; as the lead bank of the syndicate, Postal Savings Bank of China(PSBC) issued a sustainability-linked syndicated loan, with the interest rate linked to the pre-determined sustainability performance targets (SPTs), i.e. amount invested in clean energy projects, installed capacity, and CO_2 emission reductions.

With the declaration of China's "dual carbon" goals, innovative credit products linked to "carbon" have emerged rapidly. These credit products mainly link the loan interest rate to the carbon abatement performance of the company or project, which are essentially SLLs. For example, SPD Bank and CIB successively introduced **carbon neutrality-linked loans, where the loan interest rate is linked to the achievement of the carbon neutrality related targets of the financing project**; CIB introduced **carbon emission reduction-linked loans** in Guangzhou and Fujian, etc., and issued the first "carbon emission reduction dual-linked" loan in Anhui Province. For the latter, the loan interest rate was linked to the carbon emission reductions of the power generation and consumption sides, and a floating interest rate incentive mechanism was embedded to enable the financing cost to fall with the rise of carbon emission reductions, realizing "double linkage, double emission reductions"; Bank of Nanjing introduced a **carbon performance-linked loan**, with the loan interest rate linked to the carbon performance of the company's production and operation process; CIB launched **carbon footprint-linked loans** in Sichuan and Xinjiang, etc., and China Construction Bank (CCB) launched a **carbon footprint disclosure support loan** in Jiangxi, both of which linked the loan interest rate to the carbon footprint; CIB introduced domestic first **China Certified Emission Reduction (CCER) project development-linked loans**, linking the loan interest rate to the outcomes of CCER project development.

2.1.4 Green finance leasing

According to the *Guiding Opinions for Building a Green Financial System* issued by seven ministries and commissions headed by the People's Bank of China (PBoC) and the *Green Finance Terminology (Trial)*, green leasing refers to **leasing products and services provided by leasing institutions in support of economic activities such as environmental improvement, combating climate change and the economical and efficient utilization of resources**.

According to the ***China Financial Leasing Industry Development Report (2022)*** **released by the China Banking Association(CBA), financial leasing companies have increased their support for real economy sectors such as the green economy, advanced manufacturing and strategic emerging industries.** In support of the green economy, financial leasing companies have actively advanced green energy transition and structural optimization, so as to contribute to China's "dual carbon" goals. As of the end of 2022, the balance of the business had amounted to RMB 756 billion and the industry share continued to increase.

Case Study: CITIC Financial Leasing's Rooftop Distributed PV Sale-and-Leaseback Project[15]

In cooperation with three energy technology companies, CITIC Financial Leasing has successfully implemented a RMB 120 million industrial and commercial rooftop distributed PV sale-and-leaseback project. With a total installed capacity of 34 MW, this batch of power plants were installed on the roofs of factories in an industrial park in Zhejiang Province, providing enterprises in the park with green power with sufficient economic competitiveness, which can effectively alleviate the problem of "power shortage" in manufacturing enterprises. CITIC Financial Leasing has long been deeply engaged in the PV industry, and has managed more than 180 PV power stations and wind power stations with a total installed capacity of 7.6GW, making it domestic largest financial leasing company in terms of the PV power station financing scale.

The innovative aspects of the project are reflected as follows: CITIC Financial Leasing's invention patent of "Comprehensive Assessment Method and System for Asset Value of New Energy Power Plants" has been formally announced by China National Intellectual Property Administration (CNIPA) , which realizes the quality access and professional post-lease management of new energy leasing assets and lays a solid foundation for the market trading of power plants; in the meantime, it also provides one-stop in-depth "check-up" services for PV power plant lessees to enhance their quality and improve their efficiency, thus ensuring the stable operation of new energy power plants.

The application value of the project lies that: distributed PV has the advantages of nearby consumption of power generation, friendly grid access and comprehensive and economical utilization of rooftop resources, which is a powerful supplement to centralized power generation. However, distributed PV also faces challenges such as decentralized natural locations, small single unit sizes, and difficulty in management, raising higher demands on investment developers and financial institutions.

2.1.5 Other innovative products

(8) Innovative carbon finance products

In 2011, the National Development and Reform Commission (NDRC) formally approved the launch of pilot carbon emissions trading system(ETS) in seven provinces and cities, including: Beijing, Tianjin, Shanghai, Chongqing, Guangdong, Hubei and Shenzhen, in order to fully accumulate experience, identify and solve problems, and lay the foundation for the construction and implementation of a national carbon emissions trading system. The seven pilot provinces and cities started trading one after another in 2013~2014, and two addition local carbon markets, Sichuan and Fujian, were successively launched in December 2016. On December 18, 2017, NDRC issued the *National Carbon Emissions Trading Market Construction Plan (Power Generation Industry)*, which mean the construction of the national carbon emissions trading system (China's national ETS) was officially launched. In December 2020, the Ministry of Ecology and Environment (MEE) issued the *Measures for the Administration of Carbon Emissions Trading (for Trial Implementation)*, which comprehensively regulates national carbon trading and related activities. From January 1, 2021, China officially launched the first compliance cycle of the national carbon market, marking a new stage in the construction and development of the national carbon market. On July 16, 2021, the national carbon market officially launched trading on the Shanghai Environment and Energy Exchange, with the first batch only covering more than 2,000 enterprises in the power generation sector. As the construction of China's local and national carbon markets continues to advance, a series of innovative carbon finance products have also been developed, especially carbon-related financing services that use carbon assets as a collateral/pledge or

[15]Source: Circular on the Release of Typical Cases of Tianjin Leasing Companies Supporting the Development of Green Industry, Tianjin Financial Services Bureau website[EB/OL], 2022/01/14[2023/11/19], https://jrgz.tj.gov.cn/xxfb/tzggl_1/202201/t20220117_5780165.html

are linked to the returns from carbon assets, such as carbon collateral/pledge loans, carbon asset repurchases, and carbon bonds.

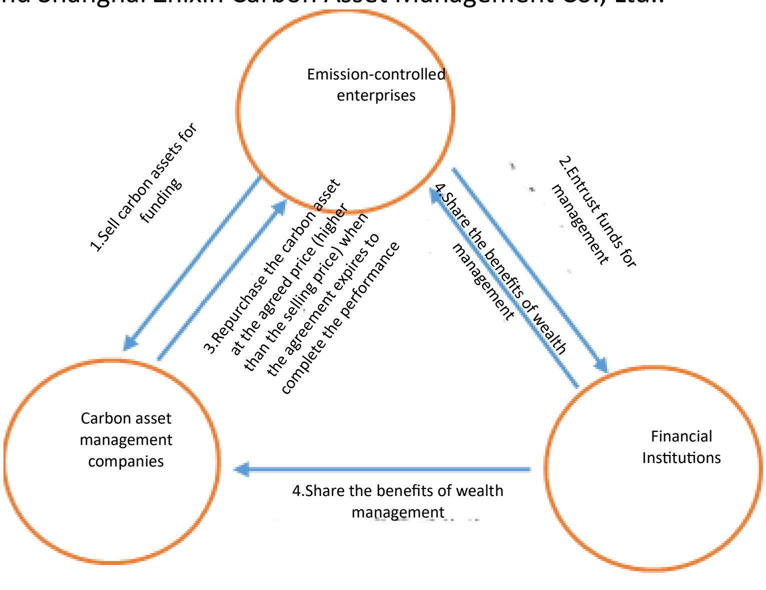
Carbon asset collateral/pledge financing refers to enterprises using the carbon assets they own (carbon quotas, CCERs, etc.), or the income that may be generated from all the carbon assets in the future, as collateral/pledge to obtain loan financing from commercial banks. It has been carried out by many commercial banks in local pilot ETS. After the launch of the China's national ETS, there are also commercial banks engaged in quota collateral/pledge financing business in the national carbon market.

Carbon asset repurchase business refers to carbon asset holders selling their own carbon assets to other carbon market participants in order to obtain short-term financing, while agreeing to repurchase the sold carbon assets at a contracted price after a certain period of time.

Carbon bonds are bonds issued by companies to raise funds for low-carbon projects. Unlike ordinary bonds, the interest rate level of carbon bonds is linked to the income from the carbon assets of low-carbon projects.

Case Study: CIB's Carbon Asset Repurchase Business

In March 2016, CIB Shanghai Branch signed the *Carbon Quota Assets Repurchase Agreement* with Spring Airlines and Shanghai Zhixin Carbon Asset Management Co., Ltd. to complete the transfer and registration of 2015 carbon quota transactions (500,000 tons) at the Shanghai Environment and Energy Exchange, which is the first carbon asset repurchase product involving the domestic aviation sector. According to the agreement, Spring Airlines sold 500,000 tons of 2015 carbon quotas it owned to Shanghai Zhixin Carbon Asset Management Co., Ltd. and entrusted CIB Shanghai Branch to manage the funds it received from the quota transfer. The agreement stipulates that after 3 months (March 14, 2016 - June 13, 2016), Spring Airlines will repurchase the same number of carbon quotas from Shanghai Zhixin Carbon Asset Management Co., Ltd., and the annual 4% return obtained by CIB Shanghai Branch on the management of the funds during this period will be shared between Spring Airlines and Shanghai Zhixin Carbon Asset Management Co., Ltd..



(9) Green supply chain finance loans

Compared with general supply chain finance that emphasizes on trade realities and core business strengths, green supply chain finance pays further attention to environmental protection, and is an important means to realize the mutually beneficial development of enterprises and the ecological environment. At present, China's green supply chain finance is still in its infancy which integrates green finance, supply chain finance and green supply chain. As an important means integrating the above three, the green supply chain finance research carried out by CIB Research in 2019 puts forward the three major development models of green supply chain finance, which have been widely accepted and disseminated by the market, and have been included in the *Guidelines on Green Supply Chain Finance Services for the Greater Bay Area (Automobile Manufacturing Industry)*. After several years of development, green supply chain finance is now mainly presenting these three major development models.

Model 1: "Supply chain finance + green finance". Supply chain finance products and models are leveraged to increase financial support for green industries, green projects and green products in the field of green finance, and realize the effective integration of supply chain finance and green finance.

Model 2: "Green supply chain + supply chain finance". Relying on core enterprises (brand enterprises), banks, when providing supply chain financing services to their upstream suppliers, also consider environmental performance of SMEs in the industrial chain in addition to financial, technological and market factors, thus realizing the integration of the green supply chain and supply chain finance.

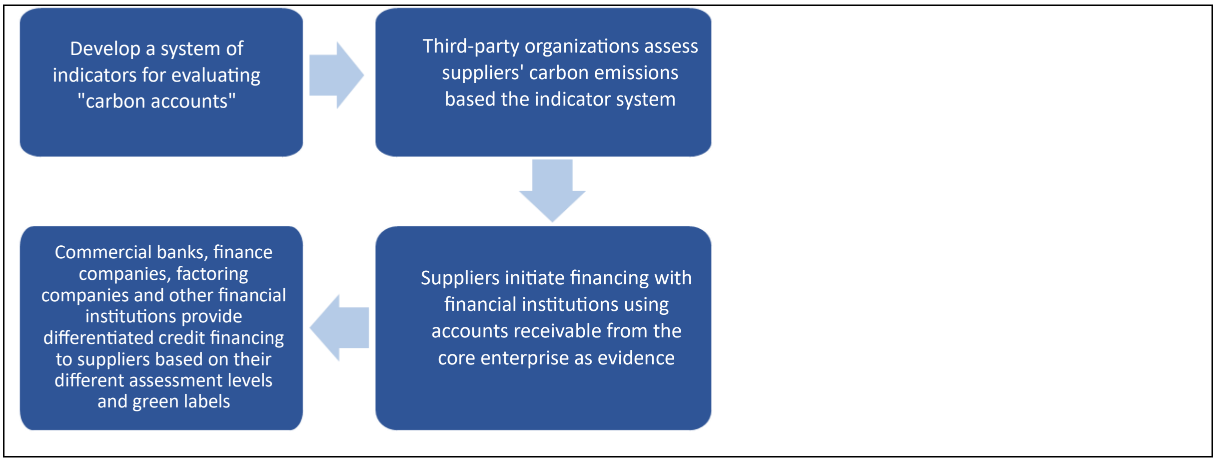
Model 3: "Green supply chain + green finance". Banks increase their support to enterprises that have carried out green supply chain management, promote the development of China's green supply chain management by means of finance, and realize the organic integration of green supply chain and green finance.

Case Study: JDH Launched China's First "Green Carbon Chain Pass" Business (Model 2)

On November 11, 2021, TCL JDH successfully launched the first "Green Carbon Chain Pass" business in China. It is the first bill discounting for supply chain based on *Guidelines on Green Supply Chain Finance Services in the Guangdong-Hong Kong-Macao Greater Bay Area - Low Carbon Rating System*. The "Green Carbon Chain Pass" business consisted of two supply chain notes in the denominations of 1.02 million and 2.47 million issued by the core enterprise, MOKA, to two suppliers, Huaxing (Shenzhen) Semiconductor and Pu'an Electronics, respectively. With the supply chain notes as the carrier, and based on the *Low Carbon Rating System*, JDH connected the core enterprise and suppliers, coordinated the funders to set up differentiated preferential interest rate pricing, and provided preferential interest rate financing for participating suppliers with a reduction of more than 130BP. The higher the low carbon rating, the lower the cost of corporate finance. This green finance project is an important practice for JDH to actively respond to the national green finance development policy, and is also an important area and direction for future exploration[16].

"Green Carbon Chain Pass" financing process

[16] Source: Factoring Weekly (Nov. 8-12, 2021),(2021/11/12)[2022/4/27], https://www.sohu.com/a/500761181_100014524



2.2 Equity-based products & instruments

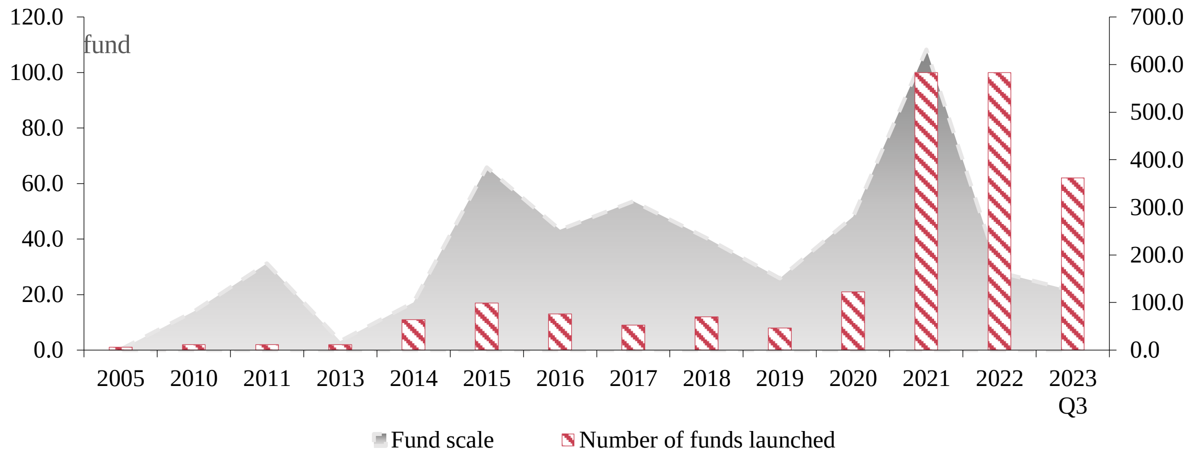
2.2.1 Green investment products

The *Green Investment Guidelines* was released, providing oriented guidelines for Chinese investors to make green investments. On November 10, 2018, after three months of consultation, the Asset Management Association of China (AMAC) officially released the *Green Investment Guidelines (for Trial Implementation)* (hereinafter referred to as the "Guidelines"), which defines "green investment" as follows: **Green investment refers to the act of adopting systematic green investment strategies in the investment in enterprises or projects which can produce environmental benefits, lower environmental costs, and reduce environmental risks for the purpose of improving corporate environmental performance, developing green industry and reducing environmental risks. Green investment should include but not limited to enhancement of energy efficiency, emission reduction, clean and renewable energies, environmental protection and restoration, and circular economy, with a focus on environmental protection, low-carbon development and recycling, etc.** In addition, the *Guidelines* also sets out the objectives of and approaches to green investments as well as an indicator framework for the environmental assessment of investment targets, which provides good guidance for fund managers to engage in green investment, and comprehensively regulates the green investment activities of fund managers following green investment philosophies. The *Guidelines* is not mandatory for all fund managers, but serves as a basic reference for green investment activities. Fund managers can, based on their own conditions, establish suitable green investment administration specifications following the principles of identifiability, calculability and comparability. Although the Guidelines is not mandatory, in terms of supervision and administration, the Guidelines requires fund managers to conduct annual self-assessment of green investment with the report including but not limited to the company's green investment philosophy, construction of green investment system, and review of green investment goals, which will to a certain extent guide more asset managers to take green factors into account in their investments and encourage various professional institutional investors to engage in green investments.

(1) Green funds

Green funds are important products and instruments for promoting green investment and accelerating the turnover of green assets. As for public green funds, this report takes the environmental protection-themed funds in the Wind Concept Sector as the initial statistical basis for public green securities investment funds in China. The number and size of public green funds launched in China since 2021 have shown a substantial rise. In 2021, the number of green funds launched was about five times that of 2020, while the total fund size also increased by 124.94% on a YoY basis. As of the end of 2023 Q3, China had launched 360 public green funds accumulatively, with a total size of RMB 292.159 billion.

Figure 18: Public green securities investment funds



Source: Wind, and CIB Institute for Carbon Neutrality and Finance

In addition, according to the *Self-Assessment Report on Green Investment of Fund Managers (2022)* issued by AMAC, among the 46 sample public funding institutions participating in the self-assessment, 33 institutions had issued or were issuing products targeting green investment, with a combined total of 108 products and combined net assets of RMB 204.553 billion as of the end of 2022 Q2. Overall, the reported green investment products show better long-term yield profile, with positive annualized yields for three and more years. In terms of investor types, individual investors, financial institutions and financial products ranked in the top three, accounting for 67.1%, 16.7% and 11.4% respectively, while long-term funds accounted for 0.2%.

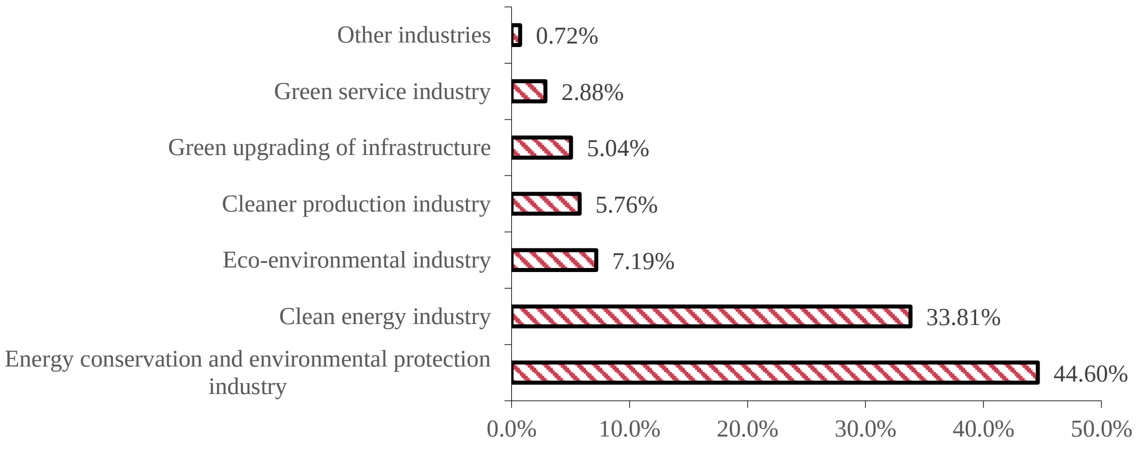
As for private green securities investment funds, according to the *Self-Assessment Report on Green Investment of Fund Managers (2022*) issued by AMAC, among the 320 sample private securities institutions participating in the self-assessment, 10 institutions issued a total of 10 products targeting green investment. The reported data shows that as of the end of 2022 Q2, the combined net assets of the 10 products totaled RMB 387 million.

(2) Green PE/VC

Green PE/VC is important in supporting the development of start-up green businesses as well as green technology innovations. With the introduction of the "dual carbon" goals and the release of related policies, green industry investment has attracted more attention from private equity investment institutions. The results of AMAC's survey in 2021[17] show that among the private equity institutions surveyed, 14.60% said that they had been engaged in green industry investment, of which 46.60% invested in energy conservation and environmental protection industry and 33.81% invested in clean energy industry. In terms of return on investment in green industry, in 2021, 60.43% of surveyed institutions' return on investment in green industry projects was less than 10%, 12.95% was in the range of 10%-20%, and only 6.48% exceeded 30%.

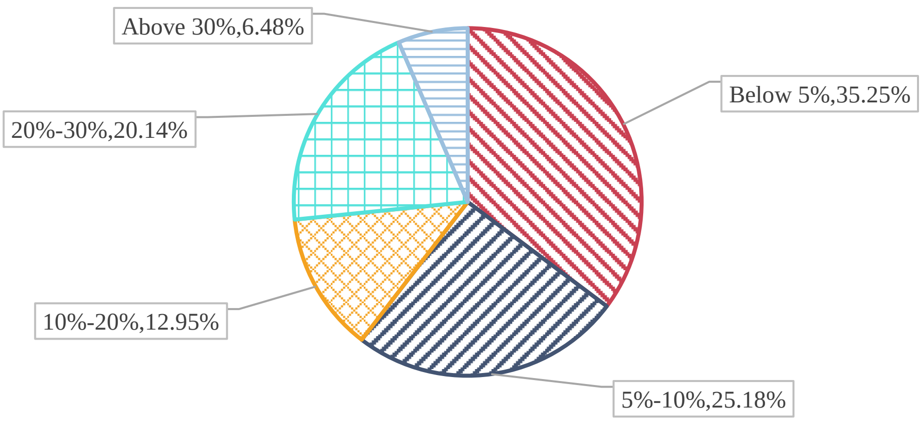
Figure 19: Distribution of green industry investments by surveyed equity institutions in 2021

[17]Source: AMAC, Report on Practicing Social Responsibility in China's Private Investment Fund Industry (2022), 2022.



Source: AMAC and CIB Institute for Carbon Neutrality and Finance

Figure 20: Returns on green industry investments by surveyed equity institutions in 2021



Source: AMAC and CIB Institute for Carbon Neutrality and Finance

In terms of green investment product creation, according to the *Self-Assessment Report on Green Investment of Fund Managers (2022)* issued by AMAC, among the 327 sample private equity institutions participating in the self-assessment, 44 institutions issued a total of 70 products targeting green investment[18]. Of these, 54 products followed a specific green investment strategy. The reported data shows that the green investment strategy mainly aimed to support green low-carbon industries, and agreement was made in the contract to invest in areas such as clean energy, new energy, energy conservation and environmental protection, new materials, ecological and environmental governance, etc. 33 products took proactive measures to enhance the green performance of their portfolio companies. Most of the sample private equity products were set up in the past three years, and their sizes were mainly concentrated in the range of RMB 200 million to 1 billion. As of the end of 2022 Q2, products ranging from RMB 200 million to 1 billion collectively accounted for 56.6% of total size. In terms of investor types, individual investors, non-financial corporations and financial products ranked in the top three, accounting for 34.7%, 29.1% and 18.5%, respectively; and long-term funds accounted for 2.7%.

Case 1: Giving full play to the guiding role of the National Green Development Fund

[18]Note: Due to a small number, products actively reported are somewhat different from the actual situation.

In June 2018, the *Opinions on Comprehensively Strengthening Eco- environmental Protection and Resolutely Fighting against Environmental Pollution*, issued by the CPC Central Committee and the State Council, proposed to "establish the National Green Development Fund". On July 15, 2020, the National Green Development Fund Co., Ltd. (NGDF) was inaugurated in Shanghai, which is a national investment fund jointly launched by the Ministry of Finance, MEE and the Shanghai Municipal Government. Taking Xi Jinping's Thought on Ecological Civilization as its guide and fundamental guideline, and building a beautiful China as its purpose, in accordance with the overall requirements for strengthening efforts to promote ecological progress, and considering the market demand, NGDF actively guides social capital investment in green development areas with strong externalities, such as air, water, soil and solid waste pollution control, and promotes the high-quality development of green industries and the green economy, such as pollution control, ecological restoration, green transport and clean energy. NGDF raised RMB 88.5 billion in its first phase, of which RMB 10 billion was contributed by the central government, and other contributors included 11 provinces and municipalities along the Yangtze River Economic Belt, some financial institutions and enterprises in related industries.

NGDF, which formally invested externally in 2021 H2, has initially achieved full coverage of the 11 provinces and municipalities of the Yangtze River Economic Belt and the five key areas. **As of 2023 Q1, a total of 25 projects had been funded, with a total contracted amount of about RMB 11.5 billion. The actual cumulative amount invested was nearly RMB 10 billion, with an amplification factor of about 9.5 times of the invested funds, all of which were invested in the five key areas of green development.**

According to the investment strategy planning, NGDF adopts three investment modes: project-based investments in green areas, equity-based investments in green industries, and sub-fund investments. To be specific, project-based investments account for 20-30%, sub-fund investments account for no more than 20%, and **the rest of the funds are used for equity-based investments**.

In terms of corporate equity-based investments, NGDF attaches importance to enhancing the overall development level of the green industry in the Yangtze River Economic Belt and linking the various links of the green industry chain of the Yangtze River Economic Belt, focusing on the leading enterprises in the industry chain, and paying attention to enterprises' driving role on the industry chain as well as their ESG demonstration role. For example, it has invested in Chint Aneng, which focuses on the development of rural distributed household PV, taking into account the benefits of implementing the "dual carbon" strategy, transforming the energy structure, revitalizing the countryside and creating zero-carbon countryside. Chint Aneng is one of NGDF's largest single investments in equity investment in industry chain enterprises, involving an investment scale of RMB 1 billion. [19]

Case 2: Shandong Green Development Fund supports Shandong's climate transition[20]

China has listed Shandong as a pilot province for the project financed by the Asian Development Bank (ADB). In September 2019, ADB approved lending US$100 million to the Shandong Green Development Fund project. The Fund leverages an innovative leverage mechanism to mobilize private, institutional and commercial capital to invest in climate-friendly infrastructure development and related business development in Shandong Province.

[19]Source: Lv Tongxuan, Deputy General Manager of the National Green Development Fund: How to invest the nearly RMB 100 billion? Jiemian News[EB/OL], 2023/6/18[2023/9/29] https://baijiahao.baidu.com/s?id=1769026996473705849&wfr=spider&for=pc

[20]Source: Feature| ADB Joins Forces with Green Climate Fund and Partners to Pioneer Climate Fund in Shandong Province, China, NDRC website[EB/OL], 2023/3/31[2023/11/20] https://www.ndrc.gov.cn/xwdt/ztzl/gwyhhkdt/202203/t20220331_1321428.html

The Fund holds US$400 million in seed money from international financial institutions and plans to raise US$360 million from public sources and US$740 million from private investors. On this basis, a total of around US$7.5 billion in climate-positive investments will be leveraged, with a target leverage ratio of 1:5. As co-financiers of the Fund, KfW and AFD have approved €100 million (about US$113.7 million) and €70 million, respectively.

The goal of the Shandong Green Development Fund is to facilitate climate change mitigation (reducing carbon emissions by 3.75 million tons per year) and adaptation (increasing the climate resilience of more than 3 million people) by 2027. It is also domestic first climate fund categorized as effective in gender mainstreaming. To date, US$100 million in financing from ADB, KfW and AFD has been used to set up the first fund of the project, the Shandong Green Development Fund Project (Phase I). In addition, the project has raised US$130 million in funding from public and private investors such as Haier Group and CATL.

The Fund has invested US$80 million in two innovative companies to support the development of a leading green logistics service platform and an electronic network of electric vehicle charging stations in China, respectively. In addition, more than US$200 million in private capital has been mobilized at the sub-project level. The two projects are expected to reduce carbon emissions by 400,000 tons per year combined.

(3) Green indices

The compilation and development of green indices, including green stock indices and green bond indices, will boost financial institutions' development of green financial products, such as index investment funds and ETF index funds, which could meet the green investment needs of investors, and will play an important role in improving the liquidity of the green finance market and expanding the investor base. In recent years, with the rapid development of China's green finance market, China's green indices and related products gradually began to diversify. At present, China's green stock indices include comprehensive green stock indices such as SSE 180 Index, CSI ECPI-ESG Sustainability 40 Index and CSI Green Investment Stock Index, as well as indices for energy conservation and environmental protection industry such as energy conservation and environmental protection, new energy, new energy vehicles and pollution control. In addition, with the rapid development of green bonds in China, there are more green bond indices, including the ChinaBond Green Bond Index Series, the ChinaBond Carbon Neutral Bond Index, and the CSI Green Bond Index Series.

According to incomplete statistics, as of September 2023, China had launched 51 green stock indices (excluding ESG stock indices) and 42 green bond indices accumulatively. Especially since 2021, the number of green indices newly launched in China has risen dramatically.

Figure 21: Number of green stock and green bond indices launched

Source: Wind, and CIB Institute for Carbon Neutrality and Finance

Despite the increasing number of green indices being launched, there are still relatively few index funds tracking these indices. As of September 22, 2023, only five of the above green stock indices were tracked by funds with a combined tracking fund size of RMB 13.333 billion. As for the above green bond indices, there is still no tracking fund, but there are wealth management products linked to the green bond indices.

Case Study: CIB Wealth Management Launched A Green Bond Index-Linked Wealth Management Product[21]

On July 12, 2023, the 11th National Low-Carbon Day, CIB Wealth Management launched the first wealth management product linked to the CIB Green Bond Index - CIB Wealth Management Fengli Yuedong Qingyun 7-Day Minimum Holding Period Rikai No. 1 Fixed Income Wealth Management Product. More than 30% of the product's investment portfolio tracks the "ChinaBond-CIB Green Bond Index", selecting high-quality green entities and exploring the investment value of green bonds.

The "ChinaBond-CIB Green Bond Index" is compiled by the China Central Depository & Clearing Co., Ltd. (CCDC) and CIB. The index constituents have good credit qualifications without defaults since its launch, and the overall credit risk is controllable. The Index has excellent historical performance, with significant excess returns relative to the benchmark index.

(4) Green trusts

On December 30, 2019, China Trustee Association (CTA) issued the *Green Trust Guidelines* (hereinafter referred to as the "Guidelines") to promote the development of green trusts by trust companies. The Guidelines defines "green trust" as follows: **Green trust refers to trust products and fiduciary services provided by trust companies through green trust loans[22], green equity investments, green bond investments, green asset securitization, green industry funds, and green public welfare (charitable) trusts, etc., in support of economic activities such as environmental improvement, combating climate change and the economical and efficient utilization of resources**. It is also proposed that: "Trust companies should recognize and promote green trusts from a strategic perspective, improve the level of green trust knowledge of trust practitioners, develop innovative green trust business model through the financial supply-side structural reform, improve their own service capacity, prevent environmental and social risks, and facilitate the transformation and upgrading of the trust companies and the trust industry, so as to realize high-quality and sustainable economic development and create a better life for people." The Guidelines clarifies the objectives of trust companies in developing green trusts and agrees on a general code of conduct for trust companies from an ESG perspective, as well as guidelines, standards and guidance documents to be followed when engaged in green trust business. At the same time, the Guidelines also provides guidance for trust companies to carry out green trust business in terms of organizational management, business implementation, internal control management and information disclosure, supervision and incentives.

In recent years, with the increasing number of green scenarios, the fields and types of business involved in green trusts have also continued to expand. According to data released by CTA[23], as of the end of 2022, China's trust industry had 728 active green trust projects, with a size of RMB 313.395 billion. In terms of the industry to which the funds are invested, as of the end of 2021, most of the trust funds were invested in the clean energy industry, totaling more than RMB150 billion, and accounting for 46.77%. It was followed by infrastructure green upgrading industry and energy conservation and environmental protection industry, accounting for 19.73% and 14.40% respectively. Under the "dual carbon" goals, innovative "carbon finance" themed trust products have been actively developed, and

[21] Source: CIB Wealth Management Launches A Green Bond Index-Linked Product to Facilitate Green and Low-Carbon Development, China Securities Journal[EB/OL], 2023/7/13[2023/11/27] https://www.sohu.com/a/699335156_120988533

[22] Note: Green trust loans are debt instruments.

[23] Source: China Trust Industry Social Responsibility Report (2022-2023), CTA, November 2023.

a number of "first" trust products linked to carbon emission reductions, carbon emission income rights and carbon assets have been launched one after another.

Table 6: Green trust investment areas and size share in 2021

Industry	Total size (RMB 100 million)	Size share
Eco-environmental industry	308.21	9.38%
Cleaner production industry	116.27	3.54%
Clean energy industry	1537.35	46.77%
Green service industry	76.6	2.33%
Energy conservation and environmental protection industry	473.42	14.40%
Infrastructure green upgrading industry	648.6	19.73%
Other industries	126.38	3.85%

Source: CTA and CIB Institute for Carbon Neutrality and Finance

Case Study: Shandong International Trust's CCER Carbon Asset Income Rights Project[24]

Shandong International Trust's CCER Carbon Asset Income Rights Project is specifically named "Shandong Trust - Carbon Neutral - Carbon Asset Investment Pooled Fund Trust Program", with a trust fund of not more than RMB 200 million. The counterparty of the project is Shandong High Speed Renewable Energy Group (SHREG), and the funds raised will be used for the assignment of CCER income rights (up to 6 million tons) held by SHREG for future development, with a term of 2 years. The key innovative aspect of the Trust Program is that: SHREG manages the underlying project and pays investment income to Shandong International Trust during the duration of the Trust Program, or repurchases the asset-specific income rights according to the contract. The Trust Program may address both the company's capital needs and the mechanism for distributing excess expected returns.

For SHREG, the issuance of the Trust Program can revitalize the CCER carbon assets, meet the company's capital needs and enable early monetization as the company will expand production capacity, improve technology, and enhance environmental standards through financing. The funds raised will be mainly used for kitchen waste treatment projects, which generally adopt the BOT model, integrating collection, transportation, and disposal, with a concession period of 20-30 years, thus raising the reduction rate of kitchen waste treatment, and contributing to the "dual carbon" goals; for Shandong International Trust, it will actively focus on carbon assets such as CCERs and engage in carbon finance business innovations.

2.2.2 ESG investment products

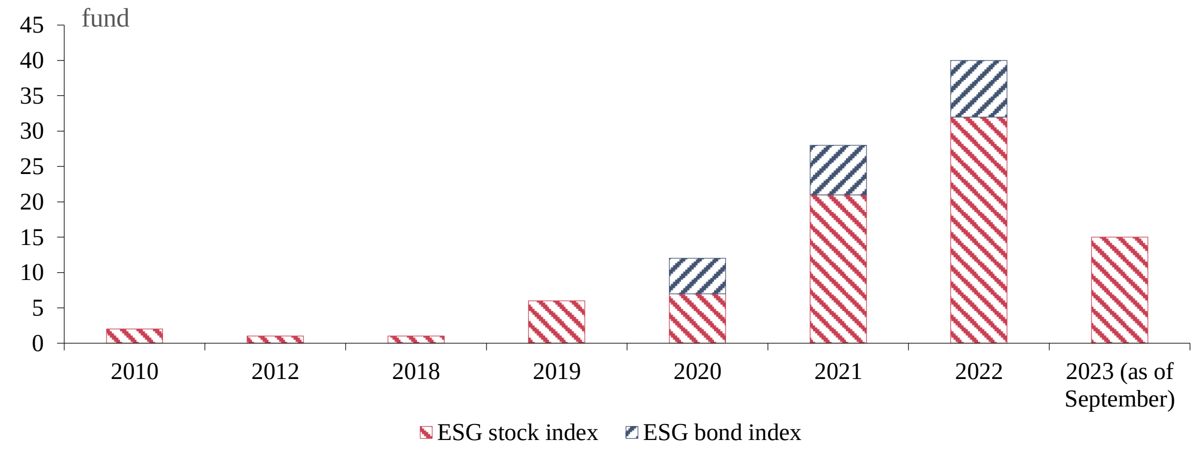
(1) ESG indices

Unlike green indices that focus on green topics, ESG indices have a broader scope and are often compiled by screening stocks or bonds with better ESG performance as constituents from a wider range of underlying stocks or bonds. For example, the CSI CAITONG ECPI ESG China 100 Index is compiled based on the ECPI ESG rating methodology, which selects 100 company stocks with higher ESG ratings from the constituents of the CSI 300 Index.

According to incomplete statistics, as of September 2023, China had launched 85 ESG stock indices and 20 ESG bond indices accumulatively. Similar to green indices, ESG indices have seen a significant increase in the number of indices launched since 2021.

Figure 22: Number of ESG stock and ESG bond indices launched

[24]Source: Green Trust Casebook, CTA, April 2023.



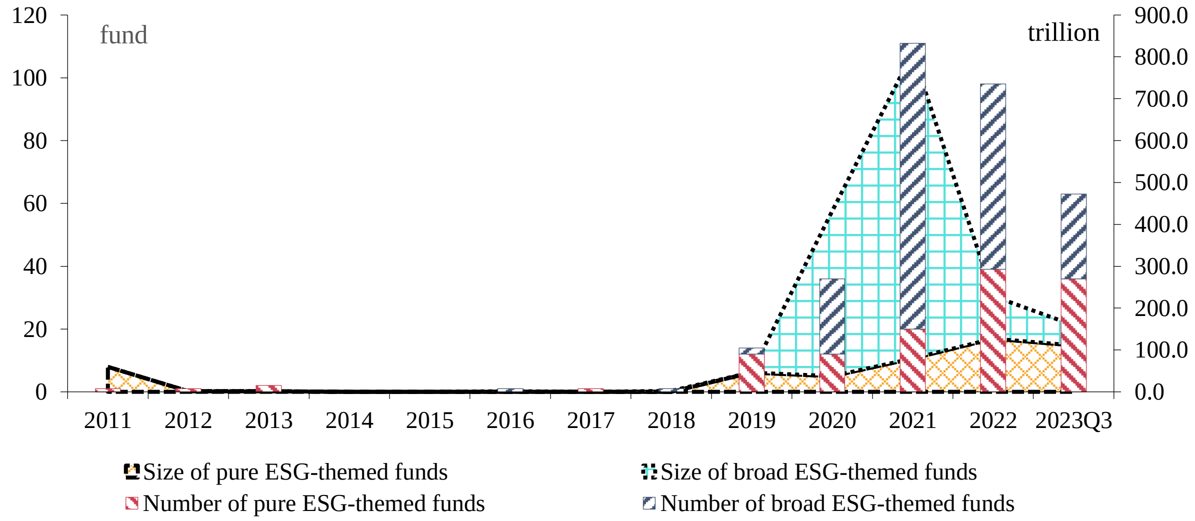
Source: Wind, and CIB Institute for Carbon Neutrality and Finance

Similar to green indices, there are still fewer index funds tracking ESG indices, and as of September 22, 2023, only four of the above ESG stock indices were tracked by funds, with a combined size of RMB 958 million.

(2) ESG funds

According to Wind Concept Sector statistics, as of the end of 2023 Q3, China had launched 329 public ESG investment funds accumulatively. Especially since 2021, the number of public ESG investment funds launched in China has grown rapidly. Public ESG investment funds include both pure ESG-themed funds whose fund names or investment strategies explicitly indicate that they are ESG, sustainable investment or responsible investment funds, as well as pan-ESG-themed funds whose investment targets are only related to certain ESG segments. Specifically, China has launched 124 pure ESG-themed funds and 205 pan-ESG-themed funds accumulatively. From the perspective of fund size, as of the end of 2023 Q3, the combined size of China's public ESG investment funds had reached RMB 174.303 billion, of which the pure ESG-themed funds accounted for 26.56%.

Figure 23: Number and size of ESG funds launched



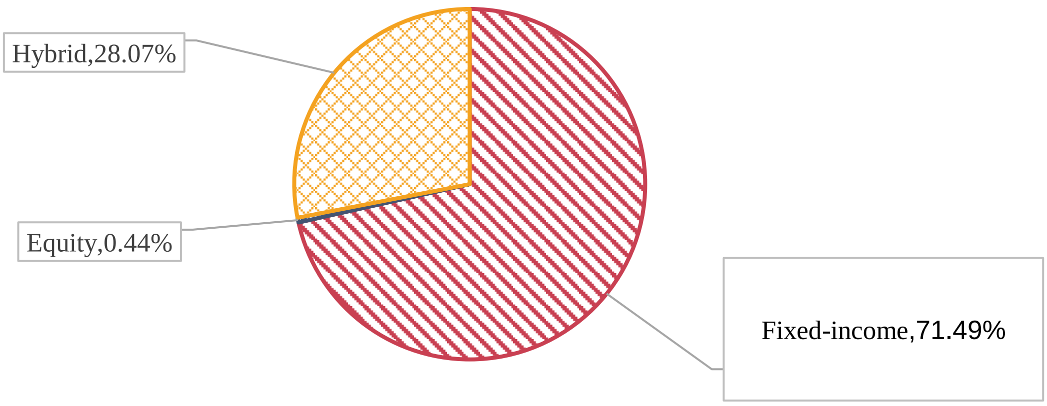
Source: Wind, CIB Institute for Carbon Neutrality and Finance.

As for the private funds, AMAC's survey results[25] show that in 2021, more than 60% of the surveyed private fund institutions indicated that they were very familiar, somewhat familiar or largely aware of ESG investment concepts. Of these, 6.92% of the surveyed private equity investment funds and 4.02% of the surveyed private securities investment funds had incorporated ESG into their investment considerations, increased by approximately 1 percentage point from 2020.

(3) ESG wealth management products

In 2019, Huaxia Bank issued China's first ESG-themed wealth management product - "Huaxia Bank - Longying Fixed Income ESG Concept 01". Since then, the number and scale of ESG-themed wealth management products of Chinese banks began to grow rapidly. According to CHINAWEALTH.COM.CN, as of the end of 2023 Q3, banking institutions (including banks' wealth management subsidiaries) had 221 active wealth management products containing the keyword "ESG" in their names, 3 on sale and 4 in pre-sale. In terms of the nature of investment, the fixed-income category accounted for 71.49% of these 228 products; followed by the hybrid category, accounting for 28.07%; there was only one equity-based ESG wealth management product[26].

Figure 24: Percentage of ESG wealth management products by type of investment nature



Source: Wind, and CIB Institute for Carbon Neutrality and Finance

2.2.3 Climate investment and financing products

Addressing climate change is an important aspect of China's green development. Especially after the announcement of the "dual carbon" goals, carbon reduction has become the main line of green development. Therefore, China's green investment products and markets are increasingly focused on low-carbon and climate change sectors. This section has been covered in the previous section on green investment products. In this section, climate indices, climate funds, and climate private equity investment products focusing on climate are presented separately.

(1) Climate indices

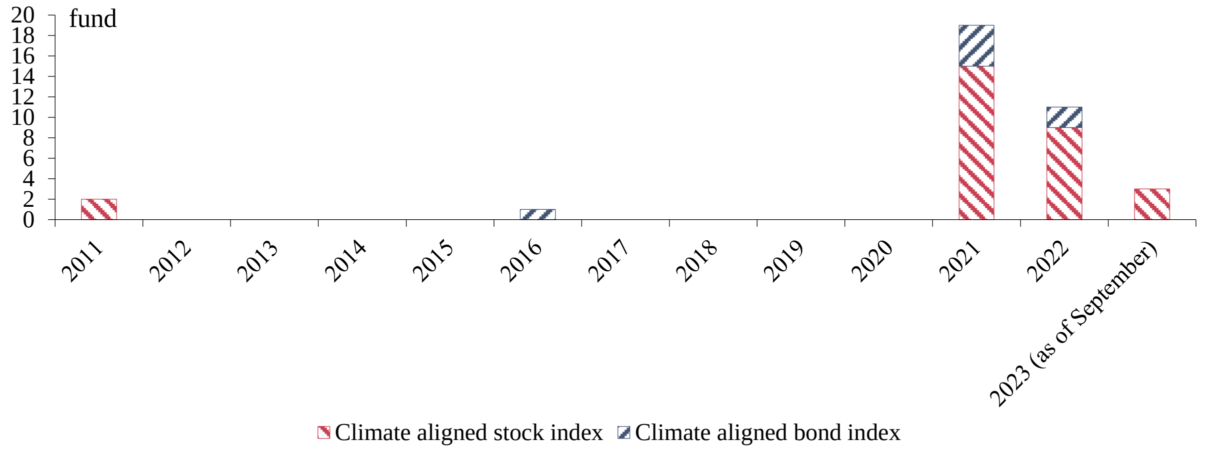
Among the green indices launched in China, there are index series focusing on climate change, such as the ChinaBond Climate Aligned Bond Index released by ChinaBond, and carbon neutral index series launched one after another after the "dual carbon" goals was declared. According to incomplete

[25]Source: AMAC, Report on Practicing Social Responsibility in China's Private Investment Fund Industry (2022), 2022.

[26] Source: CHINAWEALTH.COM.CN, https://www.chinawealth.com.cn/zzlc/jsp/lccp.jsp, [2022/9/26]search by keyword "ESG".

statistics, as of September 2023, China had launched 29 climate aligned stock indices and 7 climate aligned bond indices accumulatively. As of September 22, 2023, only three of the above climate aligned stock indices were tracked by funds with a combined fund size of RMB 12.156 billion.

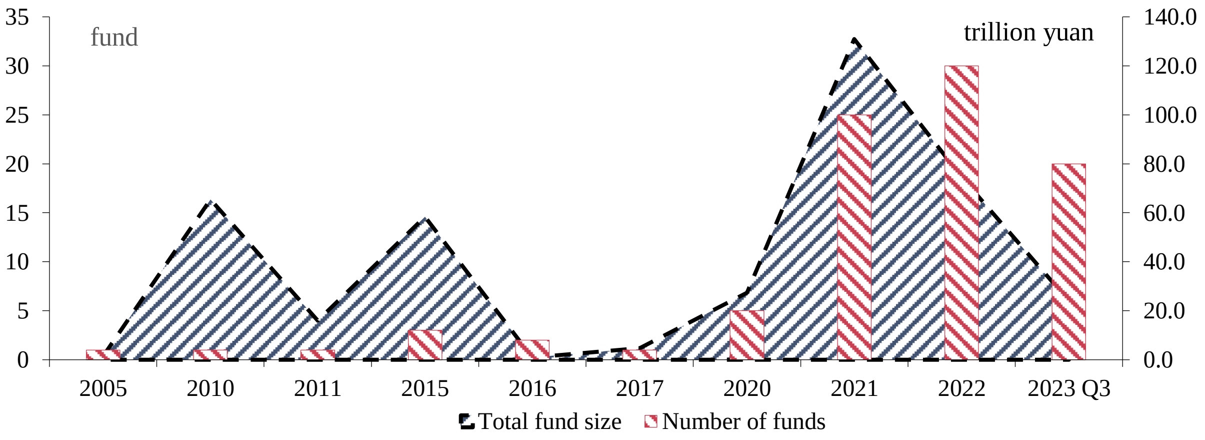
Figure 25: Number of ESG stock and ESG bond indices launched



Note: Climate aligned indices are selected from green indices based on keywords such as "climate", "carbon neutral" and "low carbon".
Source: Wind, and CIB Institute for Carbon Neutrality and Finance

(2) Climate funds
At present, among the public green funds launched in China, there are funds focusing on climate change, such as Truvalue Asset Management Climate Change Fund established in December 2020, which focuses on investing in selected climate change responsible investment-themed securities; and CIB Carbon Neutral Theme Fund established in February 2022, which focuses on investing in carbon neutrality-themed securities. As of the end of 2023 Q3, China had launched 89 public climate funds[27], with a combined fund size of RMB 40.375 billion. Positively influenced by the proposed "dual carbon" goals, the number and size of China's climate funds launched have risen sharply since 2021. Over 80% of the climate funds were launched after 2021.

Figure 26: Number of Climate funds launched



[27]Caliber of statistics: screen Wind environmental protection themed funds for funds that include "Climate", "Low Carbon" and "Carbon Neutral" in their full security names.

Source: Wind, and CIB Institute for Carbon Neutrality and Finance

(3) Climate private equity investments
Technological innovation is essential to combating climate change. In particular, the achievement of carbon neutrality will require a series of major disruptive technological innovations to drive the formation of new energy systems, industrial systems, and new modes of production and consumption, for which private equity investments can provide important support. AMAC's survey results show that 46.60% of the private equity investment institutions engaged in green industry investment had invested in energy conservation and environmental protection industry, and 33.81% invested in clean energy industry, and clean energy, new energy, energy conservation and environmental protection, and other climate-related sectors were also the main investment direction of green private equity investment products.

Case Study: Carbon Neutral Technology Fund
On March 29, 2021, HongShan and Envision Group announced to establish a carbon neutral technology fund with a total size of RMB 10 billion to invest in and cultivate global leading tech companies in carbon neutrality, and to build a new zero-carbon industrial system. This is the first **carbon neutral technology fund jointly launched by a venture capital institution and a green tech company** in China, aiming to foster an innovation ecosystem through industrial fund investment, accelerate the formation of carbon-neutral technology and industrial chain, and promote zero-carbon transition.

2.3 Green insurance and disaster risk financial instruments

2.3.1 Policies and standards

On November 11, 2022, CBIRC issued the *Notice on Issuing the Statistical System for Green Insurance Business* (hereinafter referred to as the *Notice*), providing the definition of green insurance for the first time and establishing the *Statistical System for Green Insurance Business* (hereinafter referred to as the *Statistical System*). According to the Notice, **green insurance refers to the collective term for economic activities in the insurance industry that provide risk protection and financial support in areas such as environmental resource protection, social governance, green industry operation, and green living consumption.** The liability side includes insurance products and services provided by insurance institutions in green, low-carbon and sustainable development. The asset side includes investments made by insurance funds in green industries. Following the principle of highlighting key areas and addressing urgent needs first, **the *Statistical System* only includes the statistical reporting of the liability side of green insurance business.** This encompasses **Environmental, Social, and Governance (ESG) risk insurance business, green industry insurance business, and green living insurance business**[28].

In September 2023, the Insurance Association of China issued the *Green Insurance Classification Guidelines (2023 Edition)* for reference by insurance companies in conducting classification, statistics, analysis, and other related activities concerning **green insurance products, green investment of insurance funds, and green operations of insurance companies**. Additionally, the *Classification of Green Insurance Products (2023 Edition)*, *Classification of Green Investments of Insurance Funds (2023 Edition)*, and *Classification of Green Operations of Insurance Companies (2023 edition)* were released separately as attachments. The *Classification of Green Insurance Products* provides a comprehensive and detailed breakdown for the aforementioned *Statistical System* from the perspective of business service areas and typical products. It categorizes into 10 service areas (scenes) corresponding to 16

[28] Source: Officials from the relevant departments of the China Banking and Insurance Regulatory Commission (CBIRC) answered questions from reporters regarding the *Notice on Issuing the Statistical System for Green Insurance Business*, available on the official website of the CBIRC, 2022/11/11[2022/11/15] http://www.cbirc.gov.cn/cn/view/pages/ItemDetail.html?docId=1081136&itemId=915

insurance product categories, involving 69 subcategories of insurance products, and also lists more than 150 insurance products.

Table 7: Green Insurance Products

First-level directory	Second-level directory	Third-level directory	
Areas (scenes)	**Insurance categories**	**Insurance subcategories**	
1. Assisting in coping with extreme weather and cimate events	1.1 Meteorological disaster insurance	1.1.1 Catastrophic meteorological disaster insurance	1.1.3 Agrometeorological index insurance
		1.1.2 Public infrastructure destruction insurance	1.1.4 Other meteorological disaster insurance
2. Assisting in the development of green industries	2.1 Clean energy insurance	2.1.1 Solar energy insurance	2.1.5 Energy storage insurance
		2.1.2 Wind energy insurance	2.1.6 Hydrogen energy insurance
		2.1.3 Hydropower insurance	2.1.7 Grid insurance
		2.1.4 Nuclear energy insurance	2.1.8 Other clean energy insurance
	2.2 Industry optimization and upgrading insurance	2.2.1 Green manufacturing system insurance	2.2.3 Other industry optimization and upgrading insurance
		2.2.2 Circular economy insurance	
	2.3 Green transportation insurance	2.3.1 New energy vehicle industry insurance	2.3.4 Green and efficient transportation system insurance
		2.3.2 Rail transportation insurance	2.3.5 Green transportation infrastructure insurance
		2.3.3 New energy ship and aircraft insurance	2.3.6 Other green transportation insurance
	2.4 Green building insurance	2.4.1 Green building insurance	2.4.2 Other green building insurance
	2.5 Green low-carbon technology insurance	2.5.1 Green environmental protection equipment insurance	2.5.3 Green low-carbon technology insurance
		2.5.2 Green low-carbon material insurance	2.5.4 Other green low-carbon technology insurance
3. Assisting in low-carbon transition in economic activities	3.1 Low-carbon transition insurance	3.1.1 Fossil energy low-carbon transition insurance	3.1.3 Low-carbon transition insurance in the construction sector
		3.1.2 Low-carbon transition insurance in the industrial sector	3.1.4 Other low-carbon transition insurance
4. Assisting in supporting environmental improvement	4.1 Environmental pollution reduction insurance	4.1.1 Environmental pollution liability insurance	4.1.4 Hazardous goods liability insurance
		4.1.2 Ship pollution liability insurance	4.1.5 Environmental protection infrastructure insurance

		4.1.3 Oil pollution insurance	4.1.6 Other environmental pollution reduction insurance
5. Assisting in biodiversity conservation	5.1 Ecological environment insurance	5.1.1 Ecological planting insurance	5.1.6 Wildlife insurance
		5.1.2 Ecological forestry insurance	5.1.7 Ecological restoration insurance
		5.1.3 Green animal husbandry insurance	5.1.8 Landscaping insurance
		5.1.4 Green fishery insurance	5.1.9 Other ecological environmental insurance
		5.1.5 Ecological function zone insurance	
6. Assisting in green financial market construction	6.1 Green financing insurance	6.1.1 Green loan insurance	
		6.1.2 Other green financing insurance	
	6.2 Carbon market insurance	6.2.1 Carbon trading insurance	6.2.3 Other carbon market insurance
		6.2.2 Carbon sink insurance	
7. Assisting in green, low-carbon and safe social governance	7.1 Green and low-carbon social governance insurance	7.1.1 Safety production liability insurance for green and low-carbon governance	7.1.4 Green service insurance
		7.1.2 Public safety liability insurance for green and low-carbon governance	7.1.5 Other green and low-carbon social governance insurance
		7.1.3 Critical infrastructure insurance for green and low-carbon governance	
8. Assisting in green and low-carbon communication and cooperation	8.1 Green and low-carbon trade insurance	8.1.1 Green foreign trade insurance	8.1.3 Green domestic trade insurance
		8.1.2 Green "Belt and Road" insurance	8.1.4 Other green and low-carbon trade insurance
	8.2 Green and low-carbon activity insurance	8.2.1 Green and low-carbon exhibition insurance	8.2.3 Other green and low-carbon activity insurance
		8.2.2 Green and low-carbon event insurance	
9. Promoting a green and low-carbon lifestyle	9.1 Green lifestyle insurance	9.1.1 New energy vehicle insurance	9.1.3 Residential full renovation quality insurance
		9.1.2 Non-motorized vehicle insurance	9.1.4 Other green lifestyle insurance
10. Others		10.1 Corporate sustainable development insurance	10.2 Other green insurance

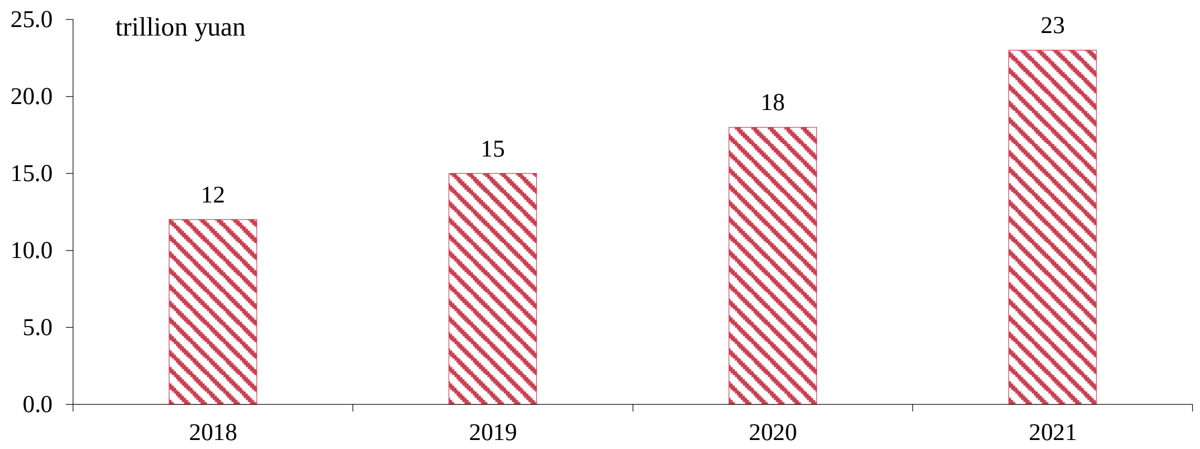
Source: *Classification of Green Insurance Products (2023 Edition)*, CIB Institute for Carbon Neutrality and Finance

2.3.2 Market overview

Green insurance has a natural advantage in promoting the achievement of the "dual carbon" goals through core functions such as resource allocation and risk management. Green insurance leverages both the liability and asset sides, actively serving the green and low-carbon transition.

On the liability side, from 2018 to 2021, the insurance industry cumulatively provided a total coverage of 68 trillion yuan in green insurance for the entire society in China. On the asset side, it includes investments made by insurance funds in green industries, mainly through various forms of green investments such as green bonds, debt plans, stock investment, equity investment, public and private equity funds, and trust plans. According to the data statistics from the Insurance Asset Management Association of China, by the end of 2022, the registered scale of insurance funds' debt investment plans, equity investment plans, and insurance private equity funds supporting the development of green industries is close to 1.2 trillion yuan, with an average annual growth rate of nearly 50% compared with 2020.

Figure 27: Green insurance coverage situation in China



Source: Insurance Association of China and CIB Institute for Carbon Neutrality and Finance

2.3.3 Meteorological disaster insurance

As global warming leads to frequent occurrences of extreme weather risk events, in recent years, a series of meteorological disaster insurance products have emerged to address the risks associated with extreme weather and climate events. According to the *Classification of Green Insurance Products (2023 Edition)*, the meteorological disaster insurance mainly includes four categories: catastrophic meteorological disaster insurance, public infrastructure destruction insurance, agrometeorological index insurance, and other meteorological disaster insurance. Specific insurance products encompass insurance for residential property loss of urban and rural residents caused by typhoons and floods, rural housing insurance, and meteorological index insurance for planting, etc.

Table 8: Meteorological disaster insurance products

Areas (scenes)	Insurance categories	Insurance subcategories	Examples
1. Assisting in coping with extreme weather and cimate events	1.1 Meteorological disaster insurance	1.1.1 Catastrophic meteorological disaster insurance	Insurance for residential property loss of urban and rural residents caused by typhoons and floods, regional catastrophe insurance, catastrophe index insurance, catastrophe relief expense compensation insurance, natural disaster relief insurance, etc.
		1.1.2 Public infrastructure destruction insurance	Rural public property insurance, rural housing insurance, urban housing insurance, road destruction insurance, embankment disaster insurance, etc.
		1.1.3 Agrometeorological index insurance	Meteorological index insurance for planting, meteorological index insurance for livestock farming, meteorological index insurance for forestry, etc.
		1.1.4 Other meteorological disaster insurance	(Other green insurance products exclusive or generic for meteorological disasters)

Source: *Classification of Green Insurance Products (2023 Edition)*, CIB Institute for Carbon Neutrality and Finance

Case 1: "Meteorology + insurance + futures" aquaculture temperature index insurance product in Guangdong[29]

In July 2023, the aquaculture temperature index insurance product, jointly developed by China Life Property & Casualty Insurance Company Limited Guangdong Branch (hereinafter referred to as Guangdong China Life P&C Insurance), Zhongtai Futures Co., Ltd. (hereinafter referred to as Zhongtai Futures), and Tensoren Technology (Shanghai) Co. Ltd., based on the "Central Meteorological Observatory of CMA - Dalian Commodity Exchange Temperature Index", was officially launched in Guangzhou.

The aquaculture temperature index insurance is linked to the daily average temperature index of Guangzhou station in the "Central Meteorological Observatory of CMA - Dalian Commodity Exchange Temperature Index". Once the index exceeds the trigger value for indemnity on a certain day, the insured local farmers for white-leg shrimps and four major Chinese carps can receive compensation. The higher the temperature, the greater the compensation. It is anticipated that the first phase of the project will provide aquaculture farmers with more than 3 million yuan in risk protection. Compared with traditional aquaculture insurance, the aquaculture temperature index insurance is based on an open and transparent weather index released by authoritative institutions, and farmers can easily access daily index information through official channels. At the same time, the triggering conditions are more objective, the loss assessment efficiency is higher, and the claim settlement is simpler and more convenient. Additionally, ethical risks associated with traditional insurance are reduced.

In addition, unlike traditional weather index insurance, Guangdong China Life P&C Insurance addresses the risk of compensation associated with fishery losses due to temperature rise by transferring the risk to the risk management subsidiary of Zhongtai Futures through over-the-counter derivatives. Zhongtai Futures then disperses the assumed risk to air conditioning

[29]Source: "Meteorology + Insurance + Futures" jointly serve Guangdong aquaculture entities to cope with high-temperature risks, China Securities Journal [EB/OL], 2023/7/31[2023/9/29] https://www.sohu.com/a/708026560_120988533

distribution companies that benefit from temperature rise through over-the-counter derivatives. This approach effectively resolves issues related to limited reinsurance support for insurance companies, challenges in risk diversification, and profit loss for air conditioning distribution companies during temperature drop.

Case 2: China's first ecological value insurance for wetland carbon sink implemented in Ningbo[30]

On April 7, 2022, China's first ecological value insurance for wetland carbon sink was piloted in Ningbo Qianwan New Area, providing risk coverage for carbon sink losses in Hangzhou Bay Wetland.

Wetland carbon sink insurance is based on the surplus value of wetland carbon sink (including the economic value of carbon sequestration and restoration cost) as the compensation basis, and provides coverage for wetland damage caused by natural disasters such as typhoon and drought, leading to a reduction in the wetland carbon sink. The compensation can be used as expenses for post-disaster wetland carbon sink resource rescue, carbon source removal, wetland resource cultivation, strengthening ecological protection and restoration, and other activities associated with the surplus value production of wetland carbon sink.

With the support of Ningbo Municipal Bureau of Ecology and Environment, Ningbo Financial Regulatory Bureau, Ningbo Banking and Insurance Regulatory Bureau, and Swiss Re, China Pacific Property Insurance Ningbo Branch has conducted research and development on ecological value insurance for wetland carbon sink, combining it with the practical operation of the Hangzhou Bay Wetland. In collaboration with the Agricultural Bank of China Hangzhou Bay Branch, credit was extended to wetland construction management companies based on the ecological value of wetland carbon sink, thereby realizing the financial support function for the wetland carbon sink value.

Specifically, the ecological value insurance for wetland carbon sink covers the wetland carbon sink value and restoration cost. The bank extends credit to wetland operating units based on the wetland carbon sink value, further supporting the development and improvement of wetland ecological value, and fully ensuring the healthy and stable operation of the Hangzhou Bay Wetland. In this model, the collaboration among the government, insurance, banks and wetland management entities has formed a green finance ecosystem based on ecological value. This ecosystem is effective in aligning with green development, economic transition and industrial upgrading. It injects strong momentum into the sustainable development of green finance and explores new paths for new enterprises in the Hangzhou Bay New Area to achieve the "carbon balance" goal.

2.4 Green fintech

2.4.1 Fintech empowers green industry-finance integration

By leveraging fintech tools such as big data and artificial intelligence, we can establish a green finance-industry integration platform, which can not only ensure secure, trustworthy and efficient data exchange, eliminate information asymmetry in corporate financing, but also enable the precise matching between green financing demand and green capital supply. This approach can comprehensively improve the service efficiency of financial institutions and the success rate of corporate financing.

The application scenarios for the green finance-industry integration platform empowered by green fintech include:

[30] Source: China's first wetland carbon sink ecological value insurance has been implemented, China Clean Development Mechanism Fund [EB/OL], 2022/4/7[2023/11/20] https://www.cdmfund.org/30736.html

1) Platform for the identification and certification of green projects and green enterprises. By leveraging fintech tools, the platform can achieve automatic identification and certification and become an authoritative platform and repositories for the declaration and certification of green enterprises and projects. It can reduce the cost for financial institutions in locating and certifying green enterprises and projects. This is particularly crucial in addressing the "green identification difficulties" in small and medium-sized enterprises.

2) Platform for carbon neutrality investment and financing services in green finance. Leveraging big data technology and green credit information, with a focus on financing for green enterprises and projects, the platform allows companies to publish their green financing needs, allows financial institutions to promote various green financial products and obtain information on financing needs for green projects. This facilitates the connection of financial services between financial institutions and green enterprises and project.

3) Platform for promoting capacity building and policy guidance. By establishing a repository of experts in carbon neutrality and green finance, as well as a repository of third-party professional service organizations, it can become a capacity-building platform that disseminates knowledge on carbon peaking, carbon neutrality and green finance. In addition, it serves as an information release platform for local government agencies regarding plans, policies and systems related to carbon peaking, carbon neutrality and green finance. The platform aims to guide and incentivize increased social capital investment in green industries, contributing to the high-quality development of local regions.

Currently, some local governments, including Huzhou, Guangzhou, Chongqing, Quzhou, Lanzhou, Fujian, and other places, have utilized technological means to establish green finance-industry integration platforms, achieving positive results.

Case 1: "Green Finance Comprehensive Service Platform" in Huzhou City

The "Green Finance Comprehensive Service Platform" includes modules such as "Green Loan Connect", "Green Credit Connect", "Green Wealth Treasure" and "Green Governance Connect". It provides comprehensive financial services for enterprises, individuals, financial institutions, government departments, and more.

Co-sponsored by the Huzhou Municipal Finance Office, the People's Bank of China Huzhou Branch, and the former Banking and Insurance Regulatory Bureau of Huzhou, "Green Loan Connect" offers one-stop and comprehensive financial services for corporate clients, covering areas such as bank loans, equity financing, guarantee credit enhancement, and financial services related to carbon account. It takes the lead in exploring aspects such as bank-enterprise integration, product innovation, service mechanisms, and promoting smooth financing, achieving certain positive results. As of November 2023, over 55,000 small and micro businesses have been registered. The platform has facilitated connections between banks and over 40,000 enterprises, resulting in nearly 500 billion yuan in bank loans secured for these businesses. In addition, the platform has facilitated over 470 equity financing projects, and the total equity financing amount achieved has exceeded 10 billion yuan. [31]

"Green Credit Connect" is the supporting IT system for the Huzhou City green financing entity identification and evaluation methodology system (3.0 version). This evaluation methodology was jointly developed by the Huzhou Municipal Finance Office, the People's Bank of China Huzhou Branch, and the former Banking and Insurance Regulatory Bureau of Huzhou. Technical upgrade support for the system is provided by Lianhe Equator Environmental Impact Assessment Co., Ltd. "Green Credit Connect" is oriented towards financial institutions, offering multi-dimensional and specialized green finance tools to support innovation in green finance. The platform incorporates a green finance data engine, a green financing entity ESG evaluation system, and a credit asset carbon

[31] Source: official website of Huzhou Green Finance Comprehensive Service Platform - Green Loan Connect, [2023/11/24] https://lvdt.huzldt.com/

accounting system. It conducts green certification and evaluation for enterprises and projects, effectively addressing the challenge of "green identification difficulties" faced by small and medium-sized enterprises. Local governments implement green finance incentive policies, providing loan interest subsidies for green enterprises and projects. The ESG evaluation model for green financing entities is upgraded to realize ESG evaluation of these entities.

"Green Wealth Treasure" is led by the Huzhou Municipal Finance Office. China Construction Bank Huzhou Branch is involved in the pilot project of "Personal Carbon Account", which aims to provide high-quality and convenient financial services for the general public, and advocate a low-carbon lifestyle. The platform offers online personal loan products and a financial knowledge academy, supporting users to obtain more favorable loan interest rates by using carbon credits. This effort aims to assist in green entrepreneurship and consumption. Simultaneously, the platform provides fully online channels for credit card and insurance processing. It constructs scenarios for carbon reduction, such as garbage classification and bicycle sharing, ensuring that users can enjoy a rich and affordable lifestyle while encouraging energy conservation and carbon reduction.

"Green Governance Connect" is oriented towards government departments to create interaction scenarios of connectivity, collaboration and data intelligence, and promote the modernization of financial service governance.

Case 2: "Financial Service Cloud Platform" in Fujian

The "Financial Service Cloud Platform" in Fujian Province, developed and operated by Industrial Bank, utilizes financial technologies such as big data, cloud computing, and artificial intelligence. It achieves comprehensive financial service functions including enterprise profiling, credit analysis, and online intelligent financing connection. The platform focuses on the closed loop of online processes, realizing "enterprise registration, authentication, authorization, business application—platform intelligent matching—online bank connection—timely implementation of policies". The full online processing effectively overcomes the bottleneck of information asymmetry between banks and enterprises, alleviating the financing challenges faced by private and small to medium-sized and micro enterprises.

As of now, the platform has attracted over 320,000 registered users, successfully addressing financing needs with a total amount exceeding 270 billion yuan. On this platform, there are dedicated zones for green economy projects, green construction projects, and green industrial finance, allowing for the submission of applications for green enterprises and projects. Once a company passes the review and verification process, it can simultaneously apply for government subsidies and special financing products within the dedicated zones. The platform can realize the seamless connection between qualification declaration and policy implementation.

2.4.2 Fintech empowers green finance regulation

Starting with regulatory technology, Fintech serves the green finance regulation and service departments, explores solutions for green finance regulation technology, and creates more efficient and effective regulatory measures and service mechanisms to support the development of green finance reform. Examples of specific application scenarios include:

Establishing a green finance regulation information platform. Establish a financial information statistics platform through fintech tools to assist financial regulatory authorities in enhancing regulatory efficiency. Through real-time collection, statistical analysis and management applications of green finance business information, the platform provides comprehensive information and data support for green finance support policies and derivative transactions. In addition, it achieves precise statistics on energy conservation, emission reduction, and environmental benefits, laying the data foundation for subsequent environmental benefit transactions. The platform achieves the evaluation of the benefits of green loans, and provides systematic support for the government and regulatory departments to develop policy incentives and conduct performance assessment. Explore the automation of green credit performance evaluation. For example, the Green Finance Information Management System pilot-developed by the People's Bank of China in Huzhou integrates green credit statistical analysis, green credit process supervision, and assessment of the implementation effects of green credit policies. By leveraging fintech tools such as big data, artificial intelligence and cloud computing, this system aims to create an information management platform for green credit business that is traceable, comparable and measurable.

Green bond service mechanism. Blockchain can be used to establish a decentralized financing platform for green infrastructure or green bonds. Leveraging its characteristics such as transparency, fast settlement, and security, blockchain can reduce project financing costs, attract more investors and diversify investment risks. For example, BIS collaborated with the Hong Kong Monetary Authority to establish a prototype digital platform. This platform integrates technologies such as blockchain, smart contracts, the Internet of Things (IoT), and digital assets. It allows retail investors to buy and sell green bond tokens and enables continuous tracking of coupon payments as well as the positive environmental impacts achieved by the invested projects in terms of emission reduction.

2.4.3 Fintech empowers the development of green finance business and the management of environmental and climate risks

Through big data technology, artificial intelligence, remote sensing and other means, dynamic collection of environmental and climate risk investigation materials and data is achieved. This aids banks in efficiently screening and assessing the green industries and environmental and climate risks associated with loan customers and projects. By employing environmental climate risk models, scenario analysis and stress testing, Fintech can support financial institutions in managing environmental and climate risks, along with the credit risks arising from them. In addition, it is possible to conduct online collection and real-time analysis of environmental and climate risk information, realize timely and automatic risk warning and disposal, and explore the use of financial technology for the quantitative assessment of environmental and climate financial risks. For example, the Postal Savings Bank collaborates with the Institute of Public & Environmental Affairs (IPE) to integrate the environmental protection data from the Blue Map into the Postal Savings Bank's "Golden Eyes" credit risk monitoring system. This initiative aims to conduct environmental and climate risk management while also exploring carbon accounting for corporate clients.

Leveraging fintech to establish green finance business scenarios, such as green consumer finance and ESG investment: 1)commercial banks, consumer finance companies and other financial institutions utilize financial technology to offer low-interest green consumer credit products to consumers who purchase environmentally friendly products, such as home appliances with high energy efficiency ratings. Additionally, they provide mortgage loans or insurance products with favorable interest rates to consumers who buy new energy vehicles, thereby providing comprehensive green consumer financial services. 2) Financial institutions can use big data, artificial intelligence and other means to incorporate environmental, social, and governance (ESG) factors into investment research, investment decision-making and investment management. For example, Harvest ESG research team collaborates with Data Lab, a data research center, to develop and establish a localized ESG scoring system based on deep ESG data mining and research in China, and through the use of technologies such as artificial intelligence, machine learning and natural language processing. This system enables data and research-driven in-depth analysis, and realizes intelligent investment research.

In line with the direction of green finance regulation, fintech promotes the refined management of green finance business. In recent years, the People's Bank of China, the China Banking and Insurance Regulatory Commission, and other departments have continuously improved the green finance policy framework, placing higher requirements on the development of green finance in banks. This includes the classification management of customer environmental and social risks, list management and early-warning management of customers related to violation of environmental laws and regulations, and review of environmental and social risks. In this context, the green finance business management system for financial institutions empowered by fintech came into being. Institutions such as CIB and Huzhou Bank are actively developing and applying systems related to the management of green finance business and environmental risk management.

Case 1: CIB's "Turn Green into Gold" System

The Phase 1 project of CIB's "Turn Green into Gold" system was launched in July 2017, integrating fintech with the demands of green finance business. This system is the first domestically developed green finance IT support platform by a financial institution, and also stands as the leading specialized green finance system among domestic financial institutions.

The "Turn Green into Gold" system has undergone multiple iterations and updates, encompassing various functional modules such as green customer management, green business identification, environmental benefit calculation, green asset management, Equator Principles review, and green credit assessment of key energy-consuming enterprises. The system includes 40 independently-developed environmental benefit calculation models, covering dozens of industries related to low-carbon economy, circular economy, ecological economy, etc. It aligns with the green credit and green finance bonds of the People's Bank of China and the China Banking and Insurance Regulatory Commission. The system incorporates centralized asset management and introduces AI models for the first time. It has developed a geographic information system (GIS) module and extensively utilized big data analysis technologies to improve the efficiency of green finance project identification, customer service, and marketing precision.

2.4.4 Fintech empowers bank carbon neutrality and information disclosure

In the face of the trend towards net-zero development, the digital management and information disclosure of carbon emissions by financial institutions and businesses become particularly crucial. On the one hand, financial institutions such as banks need to utilize technologies or collaborate with third-party technology companies to annually assess and account for their own carbon emissions and footprint. This aims to improve the accuracy and efficiency of their carbon emission data. On the other hand, they need to utilize technologies such as blockchain to account for the carbon emissions associated with investment and financing activities. Additionally, they need to employ big data and AI technologies to identify, categorize, and analyze green assets as well as brown assets. This aims to measure the climate risks associated with financial assets. With carbon neutrality and risk management as goals, the use of fintech aims to achieve the low-carbon transition of assets, the identification, monitoring, measurement and management of climate and environmental risks, as well as the monitoring and management of one's own green and low-carbon operations, along with comprehensive, accurate and timely information disclosure. One of the primary application scenarios where fintech empowers bank information disclosure is the establishment of corporate carbon accounts. Some provinces and cities that meet the criteria have taken the lead in establishing corporate carbon accounts, promoting the green and low-carbon information sharing.

Case 1: China Emissions Exchange's comprehensive service platform for carbon accounts - "Carbon Registry"[32]

On April 19, 2023, China Emissions Exchange officially opened online testing invitations for China's first comprehensive carbon account service platform, "Carbon Registry", exclusively developed by it. "Carbon Registry" integrates three major platforms: a one-stop carbon information registration platform, a blockchain-supported carbon data traceability platform, and a carbon account integration platform with interconnected management. It supports various participating entities in

[32]Source: China News https://www.chinanews.com.cn/cj/2023/04-19/9992996.shtml

conducting comprehensive services and management, such as carbon emission accounting, necessary carbon emission offset, carbon neutrality certification and declaration.

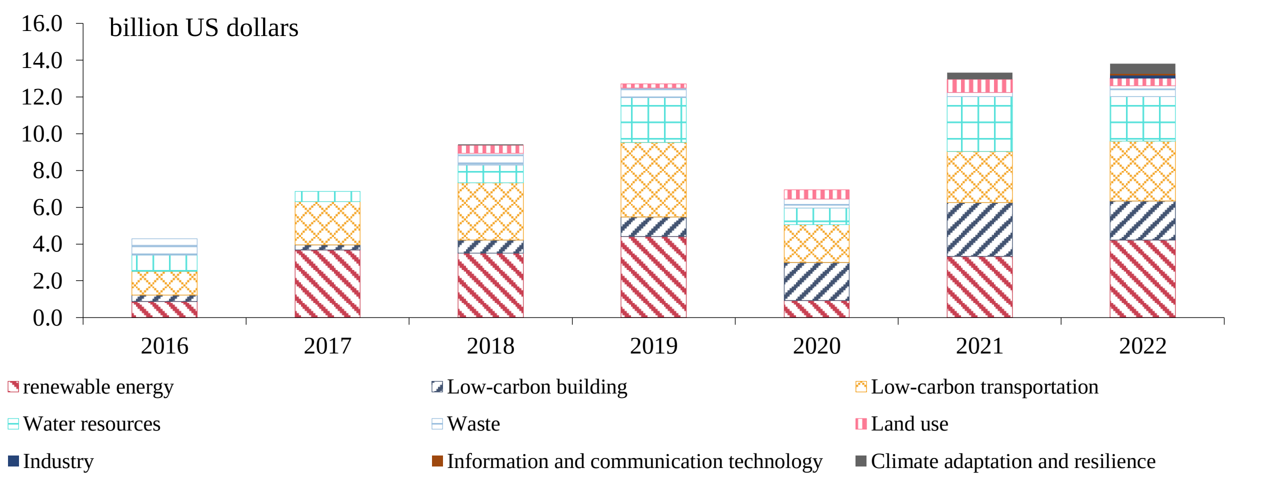
"Carbon Registry" utilizes cutting-edge information technologies such as blockchain and cloud computing. It relies on a digital carbon account system to conduct comprehensive carbon emission management across six major scenarios: organizations, products, activities, governments, financial institutions and individuals. The platform builds a digital carbon emission accounting system from three dimensions: region, enterprise and product. It constructs a carbon account based on carbon emission accounting as the core, with offsetting and neutralization as extensions, strengthening the refined management of carbon emissions by governments and enterprises. By establishing an independent, jointly-recognized, and singular data source infrastructure, the platform effectively addresses common issues in the current carbon emission accounting, such as fuzzy measurement boundaries, data reliability and independence, and data ownership affirmation and traceability. It aims to eliminate the constraints in the non-standardized process from data ownership affirmation to accounting and traceability in the carbon emission data workflow.

2.5 Cross-border financial product issuance and investment

2.5.1 Offshore green bonds

According to the data released by the Climate Bonds Initiative, from 2016 to 2022, the cumulative issuance of green bonds by Chinese issuers in overseas markets amounted to approximately $67.3 billion. Among these, the annual issuance in 2022 reached $13.8 billion, equivalent to about RMB 93.2 billion, representing a year-on-year growth of 4%. Most offshore green bonds are denominated in US dollars, followed by euros and offshore RMB. The Hong Kong Stock Exchange remains the largest listing exchange for offshore green bonds in China, accounting for approximately 43% of the total issuance volume. From the perspective of the use of proceeds, renewable energy and low-carbon transportation are the two largest sectors for the deployment of proceeds from China's offshore green bonds.

Figure 28: Annual issuance scale of China's offshore green bonds and deployment of proceeds



Source: Climate Bonds Initiative and CIB Institute for Carbon Neutrality and Finance

Case 1: CIB issued the first overseas blue bond among Chinese-funded banks

On October 30, 2020, CIB Hong Kong Branch successfully completed the bookkeeping and pricing of its dual-currency two-year bonds under medium-term notes in the international capital market. These bonds include three-year fixed-rate blue bonds denominated in US dollars and two-year anti-pandemic bonds denominated in Hong Kong dollars. In particular, the three-year fixed-rate blue bonds denominated in US dollars marked the issuance of the first overseas blue (marine and water resources conservation) bond by a Chinese-funded joint-stock bank. The bond issuance attracted enthusiastic participation from numerous global investors, with the peak order size for the US dollar tranche reaching $2.2 billion, achieving an oversubscription of 4.9 times at its peak. In the end, the blue bonds raised a total of $450 million, with a final pricing spread of T3+100 basis points and an issuance coupon rate of 1.125%.

The proceeds from this issuance of blue (marine and water resources conservation) bonds are deployed and managed under the *CIB Green Bond Framework*. All the proceeds are used for the financing of marine-related green projects such as offshore renewable energy, sustainable marine economy, marine environmental protection, and climate change adaptation in coastal areas. The bank has sought a second opinion from Sustainalytics (a global leading ESG rating and research company) to ensure that the allocation and management of the bond proceeds meet the international green bond standards[33].

Case 2: Offshore green local government bonds of Shenzhen Municipal Government

In October 2021, the Shenzhen Municipal Government successfully issued local government bonds of 5 billion yuan denominated in offshore RMB in Hong Kong. Among them, 3.9 billion yuan was designated as special bonds, which were certified as green bonds by the Hong Kong Quality Assurance Agency, with the proceeds allocated to projects related to urban rail transit and water governance. This marks the first instance of a mainland local government issuing bonds overseas and also the first instance of issuance of green local government bonds by a mainland local government in the international market[34].

Following the successful offshore bond issuance in 2021, the Shenzhen Municipal Government successfully issued offshore RMB green local government bonds in Hong Kong again in both 2022 and 2023. In 2022, the Shenzhen Municipal Government successfully issued green bonds of 1.5 billion yuan and blue bonds of 1.1 billion yuan, with the proceeds allocated to projects related to urban rail transit and water governance[35]. In 2023, the government successfully issued green bonds of 2.1 billion yuan, with the proceeds allocated to projects related to rail transit and water governance. Additionally, it issued social responsibility bonds of 2 billion yuan, with the proceeds allocated to projects in healthcare, education, and the renovation of old residential areas. [36]

Issuance of Offshore Green Local Government Bonds by Shenzhen Municipal Government

Issue date	Size	Maturity	Interest rate	UoP
October 2021	RMB 1.5 billion (green bonds)	3 years	2.7%	Urban rail transit
	RMB 2.4 billion (green bonds)	5 years	2.9%	Water governance

[33]Source: CIB issued Hong Kong's first anti-pandemic bond and the first overseas blue bond among Chinese-funded banks, official website of CIB EB/OL], 2020/11/2 [2023/9/15], https://www.cib.com.cn/cn/aboutCIB/about/news/2020/20201102.html

[34]Source: Shenzhen delivers an impressive "green report card"! As of the end of 2021, the balance of green bonds in Shenzhen reached 41.935 billion yuan [EB/OL], 2022/1/5 [2023/9/15], https://appatt.sznews.com/qiaobao/files/szxw/News/202201/05/131470.html

[35]Source: Shenzhen successfully issued offshore RMB local bonds in Hong Kong for the year 2022, Xinhua News Agency [EB/OL], 2022/11/7 [2023/9/15], https://baijiahao.baidu.com/s?id=1748846340362822656&wfr=spider&for=pc

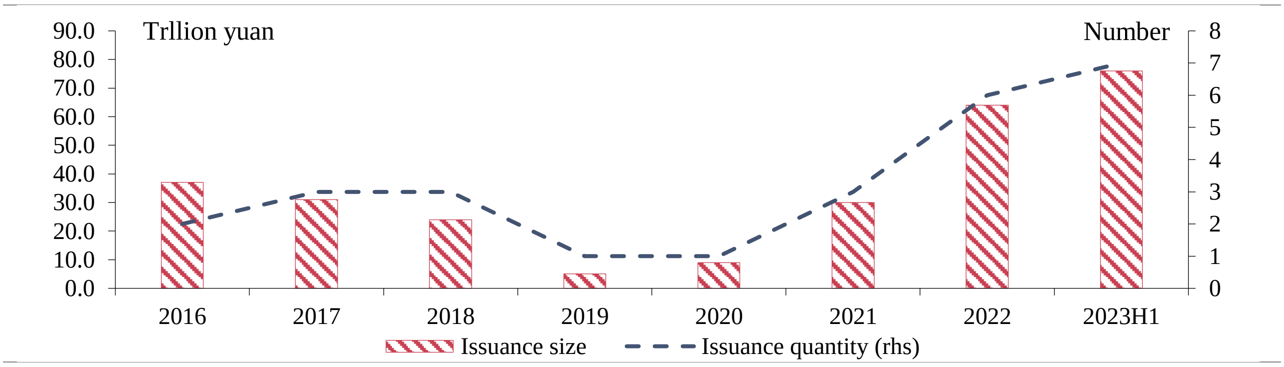
[36]Source: Announcement on the Arrangements for Issuing Offshore RMB Local Government Bonds in Hong Kong by Shenzhen Municipality in 2023, Shenzhen Finance Bureau [EB/OL], 2023/8/19 [2023/9/15], http://szfb.sz.gov.cn/gkmlpt/content/10/10793/mpost_10793061.html#4457

November 2022	RMB 1.5 billion (green bonds)	3 years	2.65%	Urban rail transit/water governance
	RMB 1.1 billion (blue bonds)	5 years	2.83%	Water governance project
August 2023	RMB 2.1 billion (green bonds)	3 years	2.55%	Urban rail transit/water governance
	RMB 2 billion (social responsibility bonds)	5 years	2.75%	Healthcare/education/renovation of old residential areas

2.5.2 Green panda bonds

According to Wind database statistics, from 2016 to the first half of 2023, overseas issuers have cumulatively issued 26 green panda bonds in the domestic Chinese market, with a total size of 27.6 billion yuan. Since 2022, there has been a significant increase in the issuance of green panda bonds, with a total size of 6.4 billion yuan in the whole year of 2022, representing a year-on-year growth of 113.3%. As of the first half of 2023, the cumulative issuance size of green panda bonds has reached 7.6 billion yuan, surpassing the annual issuance size of 2022.

Figure 29: Annual issuance size and quantity of green panda bonds



Source: Wind, and CIB Institute for Carbon Neutrality and Finance

It is worth mentioning that, in addition to green panda bonds, 4 sustainable development panda bonds with a total size of 5.65 billion yuan have also been issued in the domestic Chinese market. Among them, three were issued by the Asian Infrastructure Investment Bank. The development of panda bonds in the sustainable bond sector has been primarily benefited from the efforts of NAFMII. On November 11, 2021, NAFMII issued the *Q&A on the Pilot Implementation of Social Responsibility Bonds and Sustainable Development Bonds* [37]. The document announced the introduction of social responsibility bonds and sustainable development bonds, initiating a business pilot for overseas issuers, and promoting innovation in panda bond products.

Case: Hungary issues its first foreign-government green panda bond

On December 14, 2021, Hungary publicly issued the "first tranche of Hungarian 2021 green RMB bonds (Bond Connect)" in the Chinese interbank bond market. The issuance had a size of RMB 1 billion, maturity of 3 years, and an issuance interest rate of 3.28%. The RMB bonds issued represent the first green RMB bonds by a foreign government in the panda bond market.

The green panda bonds were issued under Hungary's green bond framework, which aligns with the relevant voluntary guidelines of the International Capital Market Association (ICMA) and the latest market practices. The use of proceeds is in line with the *Green Bond Endorsed Projects Catalogue (2021 Edition)* of China. Under Hungary's green bond framework, qualified green expenditure projects encompass six categories: renewable energy, energy efficiency improvement,

[37]Source: Q&A on the Pilot Implementation of Social Responsibility Bonds and Sustainable Development Bonds, NAFMII [EB/OL], 2021/11/11 [2022/05/29] http://www.nafmii.org.cn/xhdt/202111/P020211111557619394075.pdf

environmentally sustainable management of biological resources and land resources, water resources and wastewater management, clean transportation, and adaptation. The proceeds from the green panda bond issuance will be incorporated into the issuer's green funds and used for qualified green expenditures under Hungary's green bond framework. This aims to facilitate Hungary's transition towards a low-carbon, climate-adaptive, and environmentally sustainable economic model[38].

On November 16, 2022, Hungary once again issued green panda bonds - "first tranche of Hungarian 2022 green RMB bonds (Bond Connect)" in the Chinese interbank market. The issuance had a size of RMB 2 billion, maturity of 3 years, and an issuance interest rate of 3.75%.

2.5.3 China-EU *Common Ground Taxonomy-Climate Change Mitigation* and Bond Connect Green Bonds

(1) China-EU Common Ground Taxonomy-Climate Change Mitigation

During the 2021 UN Climate Change Conference (COP26), the International Platform on Sustainable Finance (IPSF), jointly initiated by China, EU and other economies, released the instruction report of *Common Ground Taxonomy: Climate Change Mitigation* (hereinafter referred to as the CGT). An updated version was subsequently released in June 2022. The CGT includes a list of economic activities that have a significant contribution to climate change mitigation, as jointly recognized by the China's and EU's Green and Sustainable Finance Catalogue. The initial version covered major economic activities in six sectors: energy, manufacturing, construction, transportation, solid waste, and forestry. The updated version added economic activities that are important for the green transition of the construction and manufacturing industries. In total, it includes 72 economic activities that make a significant contribution to climate change mitigation, as jointly recognized by both parties. The CGT combines the characteristics and advantages of the individual catalogues of China and Europe. It is of great importance in promoting green investment and financing cooperation between China and Europe, guiding cross-border climate investment and financing activities, and reducing the green certification costs for cross-border transactions[39]. Currently, China Construction Bank, China Merchants Bank, China Industrial Bank, and Bank of China have all successfully issued green bonds in the overseas market under the framework of the CGT.

To enhance the role of the CGT in supporting the development of the green finance market, especially in the cross-border flow of green capital, the Green Finance Committee, China Society for Finance and Banking (Green Finance Committee) has organized relevant institutions to establish an expert group. The group follows the CGT to label some green bonds publicly issued in the domestic interbank bond market. On July 14, 2023, the Green Finance Committee officially released the list of the first batch of 193 Chinese green bonds that comply with the CGT. Subsequently, on September 5, the Green Finance Committee issued the list of the second batch of 27 Chinese existing green bonds that align with the CGT. The China Foreign Exchange Trade System (CFETS) will also publish these bond lists on its website and be responsible for updating and maintaining the lists for investors' reference. [40] [41]

(2) Bond Connect Green Bonds

[38]Source: "Panda bond" market achieves a new breakthrough! Hungary issued its first foreign-government green RMB bonds, NAFMII News [EB/OL], 2021/12/15 [2022/09/20] https://mp.weixin.qq.com/s/DAHK05uZ7rjATmxCDATO2Q

[39]Source: Exploring the "common language" for international cooperation on green finance, Financial Times [EB/OL], 2021/11/9 [2022/05/29] https://baijiahao.baidu.com/s?id=1715918171092362125&wfr=spider&for=pc

[40]Source: The Green Finance Committee released the list of the first batch of 193 Chinese existing green bonds that comply with the Sino-EU *Common Ground Taxonomy,* official website of the Green Finance Committee [EB/OL], 2023/7/14 [2023/9/20], http://www.greenfinance.org.cn/displaynews.php?id=4124

[41]Source: The Green Finance Committee issued the list of the second batch of 27 Chinese existing green bonds that align with the Sino-EU *Common Ground Taxonomy*, official website of the Green Finance Committee [EB/OL], 2023/9/5 [2023/9/20], http://www.greenfinance.org.cn/displaynews.php?id=4148

The mutual market access program between the bond markets of Hong Kong and Mainland China (known as "Bond Connect") enables investors from Mainland China and overseas to trade bonds in each other's markets through infrastructure connections established in Hong Kong. This includes "Northbound Connect" and "Southbound Connect" specifically. The "Northbound Connect" was launched on July 3, 2017. It allows overseas investors from Hong Kong and other regions to invest in the Mainland China interbank bond market through a mechanism that enables connectivity in trading, custody, settlement and other aspects between infrastructure institutions in Hong Kong and Mainland China.

In recent years, China has successfully issued green bonds under the "Bond Connect" program. According to statistics of the Wind database, as of the first half of 2023, the cumulative issuance size of green bonds under the "Bond Connect" in China has reached 505.802 billion yuan, accounting for 16.26% of the total issuance of green bonds.

In the future, if green bonds issued under the "Bond Connect" can meet the mutual recognition standards such as the CGT, and can obtain the relevant certifications, it is likely to attract more overseas investors.

3. Outlook on Sustainable Financial Products and Markets in China

3.1 Rapid development of transition financial products

3.1.1 China is actively promoting the effective linkage between green finance and transition finance

Ensuring the effective linkage between green finance and transition finance is one of the key policy priorities for future financial support in promoting green and low-carbon transition development. At the beginning of 2022, during the annual research work television conference, the People's Bank of China emphasized the importance of supporting green and low-carbon development, with the central focus on further deepening research on transition finance, **achieving an orderly and effective linkage between green finance and transition finance, and formulating operable policy measures**[42]. In November 2022, Xuan Changneng, Deputy Governor of the People's Bank of China, stated at the Fifth Hongqiao International Economic Forum, Parallel Session on "Transition Finance Facilitates Green and Low-carbon Development": "**In the future, the People's Bank of China will further enhance the effective linkage between green finance and transition finance, and apply the successful practices and experiences of green finance to support transition economic activitie**s."[43]

G20 released the transition finance framework, providing guidance for the construction of China's transition finance policy system. On November 16, 2022, the G20 Summit approved and officially released the *2022 G20 Sustainable Finance Report* submitted by the G20 Sustainable Finance Working Group (SFWG), which includes the *G20 Framework for Transition Finance*. It articulates 22 specific principles around five key pillars and represents **a set of high-level principles on transition finance. It will assist international stakeholders in constructing their own transition finance policies.** The *G20 Framework for Transition Finance* was led by the People's Bank of China, and it is expected that China's transition finance policy system will be formulated under this framework.

The formulation of Chinese transition finance standards is imminent. At the national level, the People's Bank of China initiated transition finance research in 2021, and has initially defined the basic principles for transition finance. It organized research on transition finance standards in four sectors, including steel, coal power, construction materials, and agriculture. When conditions are mature, these standards will be publicly released, providing a basis for meeting the reasonable financing needs of

[42]Source: The People's Bank of China held the 2022 annual research work television conference, People's Bank of China [EB/OL], 2022/4/7[2022/11/24] https://mp.weixin.qq.com/s/I-VKDIwuMzKl2YLScD7waA

[43]Source: Xuan Changneng, Deputy Governor of the People's Bank of China: further enhance the effective linkage between green finance and transition finance, Financial Times [EB/OL], 2022/11/6[2022/11/24] https://baijiahao.baidu.com/s?id=1748762601451644589&wfr=spider&for=pc

low-carbon transition in high-carbon industries[44]. At the local level, in 2022, Huzhou City took the lead nationally by issuing the *Huzhou Transition Finance Support Catalog (2022 Edition)*, covering nine high-carbon-emission industries such as textiles and papermaking. This Catalog specifies detailed technical standards or paths and sets transition benchmarks and target values for transition activities. In 2023, Huzhou updated these standards. In addition, Xinjiang, Shanghai, Tianjin, Hunan and other regions are actively advancing the formulation of local transition finance standards.

3.1.2 The continuous improvement of carbon accounting and information disclosure systems will create favorable conditions for the innovation of transition financial products

Transition finance primarily supports the low-carbon transition of high-carbon industries. Therefore, evaluating the effectiveness of transition based on carbon emission information is crucial to prevent "fake transition". This necessitates the establishment of relatively complete carbon accounting and information disclosure systems, especially at the levels of enterprises, projects and products. Currently, China has established carbon emission accounting methodology systems for 24 industries based on international standards. However, the nationwide enterprise-level carbon emission accounting is still in its early stage. The development and application of various carbon emission measurement technologies also need further progress. These factors pose challenges to the carbon accounting efforts during the implementation of transition finance business by financial institutions.

It is noteworthy that China is accelerating the construction of its carbon accounting system. In August 2022, the National Development and Reform Commission, the National Bureau of Statistics, and the Ministry of Ecology and Environment jointly issued the *Implementation Plan for Accelerating the Establishment of a Unified and Standardized Statistics and Accounting System for Carbon Emissions*. The plan proposed a comprehensive statistics and accounting methodology system for carbon emissions, encompassing regions, industries, products and lists. Additionally, it suggested the establishment of a national greenhouse gas emission factor database, aiming to gradually develop an emission factor compilation and updating system that covers a wide range, with strong applicability and high reliability. This initiative lays a solid foundation for the establishment of a complete, unified and standardized carbon emission accounting system. At the same time, the National Development and Reform Commission also stated that in the future, it will collaborate with relevant departments to formulate and implement a series of statistics and accounting methods and standards for carbon emissions, encompassing regions, industries, enterprises and products. This will be done in accordance with the principle of addressing urgent needs first and progressing from the easier tasks to the more challenging ones. The aim is to accelerate the establishment of a unified and standardized statistics and accounting system for carbon emissions. **With the standardized development of carbon accounting in industries, enterprises and products, financial institutions will have a solid foundation for innovating transition financial products based on carbon accounting.**

Furthermore, both domestic and international sustainable information disclosure benchmark systems are continuously being improved. At the COP26, the IFRS Foundation announced the establishment of the International Sustainability Standards Board (ISSB), which is dedicated to developing a globally consistent set of benchmark standards for sustainable information disclosure. On June 26, 2023, the ISSB officially released the first batch of two disclosure standards, including the *IFRS Sustainability Disclosure Standard - General Requirements for Disclosure of Sustainability-related Financial Information* (IFRS S1) and the *IFRS Sustainability Disclosure Standard - Climate-related Disclosures* (IFRS S2). Currently, ISSB has received widespread support, and the International Organization of Securities Commissions (IOSCO) and regulatory authorities in various countries and regions express their intention to consider adopting the ISSB framework for establishing information disclosure standards in the future. Internationally, the European Union (EU) has consistently been an

[44]Source: Xuan Changneng, Deputy Governor of the People's Bank of China: research has been conducted on transition finance standards in four sectors, Shanghai Securities News [EB/OL], 2022/12/12[2023/6/26] https://news.cnstock.com/news,yw-202212-4992408.htm

active promoter and leading force in the process of addressing climate change and promoting sustainable finance development. In March 2021, the EU began the phased implementation of the *Sustainable Finance Disclosure Regulation* (SFDR), which standardized and improved the ESG information disclosure for all financial market participants in the EU. In July 2023, the EU formally adopted the accompanying guidelines for the Corporate Sustainability Reporting Directive (CSRD) – the European Sustainability Reporting Standards (ESRS). This move is aimed at progressively increasing the mandatory requirements and expanding the scope of disclosure. In China, the ESG information disclosure system has been keeping pace with the times and continuously improving in recent years. The Ministry of Finance of the People's Republic of China explicitly expressed support for IFRS to establish ISSB. At the end of 2022, it signed a Memorandum of Understanding with the IFRS Foundation and decided to establish the ISSB office in Beijing, which was officially inaugurated in June 2023. The State-owned Assets Supervision and Administration Commission (SASAC) is comprehensively promoting the ESG information disclosure for listed companies controlled by central enterprises. In May 2022, SASAC released the *Quality Improvement Plan for Listed Companies Controlled by Central Enterprises*, proposing to explore the establishment of a robust ESG system. The aim is to encourage more listed companies controlled by central enterprises to disclose ESG special reports, and strive to achieve "full coverage" of relevant special reports by 2023. Hong Kong, China, is actively promoting the ESG information disclosure for listed companies. In April 2023, the Hong Kong Exchanges and Clearing Limited (HKEX) published a consultation paper on optimizing climate-related information under the ESG framework. The revised *Listing Rules* and Appendix 27 *Guidelines on Environmental, Social and Governance Reporting* will take effect on January 1, 2024. A new standalone section on climate information disclosure has been added, and the disclosure requirement has been elevated from "comply or explain" to "mandatory disclosure". Additionally, the Securities and Futures Commission (SFC) in Hong Kong has explicitly expressed support for ISSB and intends to formulate a roadmap for adopting ISSB standards.

3.2 From "green" to "sustainable": Promoting the innovative integrated development of green finance and inclusive finance

With the continuous deepening of China's green development and the maturing of the green finance market, the development of green finance in China has gradually shifted towards the sustainable finance with richer connotations in recent years. As another distinctive field where China practices the concept of sustainable development, the development of inclusive finance in China has almost started simultaneously with green finance. In fact, the development principles of green finance and inclusive finance have inherent consistency. Both are specific implementations of the financial system practicing the concept of sustainable development, and they also share a certain degree of overlap in their service objects. However, at present, China's green finance is not "inclusive" enough. In the past, the development of green finance in China still mainly focused on large and medium-sized infrastructure projects, including areas such as green construction, green transportation and green energy. There has been limited involvement in the agriculture and consumption fields. At the same time, the main participants in these green projects are generally large and medium-sized enterprises, with limited participation from small and micro enterprises[45].

However, the realization of China's "dual carbon" goals and green development cannot be separated from the green and low-carbon development of agriculture, as well as small and micro enterprises. Agriculture and forestry are important sources of carbon sinks in China, while small and micro enterprises are significant contributors to greenhouse gas emissions. Their roles are pivotal in achieving the "dual carbon" goals. **Furthermore, under the "dual carbon" goals, groups covered by inclusive financial service are also the ones that need to be focused on in adapting to climate change and achieving a fair transition**. On the one hand, the relatively vulnerable groups that inclusive finance

[45]Source: Ma Jun: Making green finance more inclusive, making inclusive finance more green, Guangzhou Green Finance Association [EB/OL], 2022/3/29[2022/11/30] https://mp.weixin.qq.com/s/bwgJ5dGeKtVpwgW9VwHtsQ

focuses on are often those more susceptible to the negative impacts of ecological environmental pollution, climate change, and other related factors. On the other hand, in the process of promoting low-carbon transition, a comprehensive change in production and lifestyle will have a greater negative impact on the inclusive groups.

Given the inseparable connection between green finance and inclusive finance, promoting the integrated development of green finance and inclusive finance could potentially bring new momentum and innovation space to the development of both. Recently, the trend of integrated development between green finance and inclusive finance in China has begun to emerge:

Small and medium-sized banks collaborate with development-oriented financial institutions to promote green and inclusive finance. In November 2022, the Asian Development Bank (ADB) signed a loan agreement with Huzhou Bank for an amount of up to 50 million US dollars. Through this project, ADB supports Huzhou Bank to enhance the green financing capabilities of micro, small and medium-sized enterprises. The ADB's green financing, with a long term, will improve the financing channels for micro, small and medium-sized enterprises, providing support for decarbonizing their businesses. In addition, Huzhou Bank offers a wide range of green financial products and services for micro, small and medium-sized enterprises[46].

Exploring technology to support green and inclusive finance. Zhejiang Province promotes the application of digital technology in the green certification of sectors such as agriculture and small and micro enterprises. For example, in Taizhou, Zhejiang, an integrated inclusive green finance service platform called "Micro Green Reach" has been established. This platform utilizes artificial intelligence to implement a green certification model for floating loans for micro, small and medium-sized enterprises. It has developed a digital model for green finance services for small and micro enterprises, characterized by the green identification of working capital loans, green assessment of entities, and green sharing of information. Within three months, the platform identified 13,000 working capital loans for financial institutions in Taizhou, with a total value of certified green loans for working capital reaching 35 billion.

Green finance support for rural revitalization has achieved initial results. Firstly, innovative products and models for green loans supporting for rural revitalization continue to emerge. For example, in terms of supporting the construction of clean energy systems in rural areas, several banks have introduced products such as photovoltaic poverty alleviation loans and "photovoltaic loans" for farmers. In terms of supporting rural pollution control, CIB has successively supported various large-scale water governance projects, including Zhejiang's "Five Waters Co-governance" and "Beautiful Villages" projects, Wuhan's "Four Waters Co-governance" project, as well as numerous projects for the governance of large water bodies such as Taihu Lake, Chaohu Lake, and Dianchi Lake. In terms of supporting the realization of ecological value in rural areas, some banks have introduced products such as forest rights pledge loans and loans for agriculture and forestry carbon sinks. Secondly, green rural revitalization bonds are beginning to gain momentum. By the end of 2022, China has issued 35 labeled green rural revitalization bonds, with a total size of 25.61 billion yuan. Among them, 12 bonds are simultaneously labeled as carbon neutrality bonds.

3.3 Green finance and sustainable finance markets will usher in diversified development

Despite the rapid development of the green finance market in China in recent years, it is still predominantly driven by green loans, accounting for over 90% of the overall green financing volume. As of the second quarter of 2023, China's green loan balance has reached 27.05 trillion yuan, while the

[46] Source: ADB and Huzhou Bank signed a loan agreement to support green financing for micro, small and medium-sized enterprises in China, ADB [EB/OL], 2022/11/4[2022/11/30], https://weibo.com/ttarticle/p/show?id=2309404832137995223446

balance of domestic labeled green bonds within the same period is only 1.81 trillion yuan. Other forms of green financing have a smaller scale. Currently, financial institutions in the banking sector play a dominant role in the green finance market. This suggests that if this structure continues in the future, the capital adequacy constraints of commercial banks will become an unavoidable issue, which will have an impact on the sustainable development of green finance in China. Moreover, most green projects have a long investment cycle, requiring banks to provide long-term loans. However, banks typically have short average liability maturity, leading to a serious problem of maturity mismatch.

At present, the relatively simple product structure of China's green finance market implies that there is potential for further breakthroughs and developments of China's green finance in the future. Promoting the diversified development of green finance and sustainable finance markets will inject new vitality into the market. **On the one hand, the role of policy-based finance will be further developed.** In the process of achieving the "dual carbon" goals, the development-oriented and policy-oriented financial institutions have unique advantages and guiding roles because of their special status. In recent years, China's policy-oriented financial institutions have actively explored the development of green finance. By the end of 2020, the green loan balance of the three development and policy banks accounted for 28% of the total green loan balance in China. In the future, these institutions will further leverage their advantages in terms of low cost, long maturity, marketization and internationalization, contributing to the development of green finance and sustainable finance in China. This will also bring positive demonstration effects to the market. **On the other hand, in addition to banks, financial institutions such as securities, funds, asset management, trusts, and insurance will further enrich China's green and sustainable finance market.** Currently, the regulatory requirements related to green finance around commercial banks in China are becoming increasingly refined. The product systems centered around green loan and green bonds are also maturing. In the future, efforts will be made to accelerate the development of green finance in securities, funds, asset management, trusts, insurance, and other financial institutions. This will provide equity investment support for green and low-carbon enterprises, projects, and critical technologies at different stages of development. Together with the bank-dominated indirect financing, these efforts will collectively form a complete financial ecosystem that supports green and low-carbon transition in China. In the past two years, policy guidelines related to green investment, green trusts and green insurance have been successively issued. Innovative products and markets have started to emerge. In the future, the green finance and sustainable finance markets will usher in diversified development.

3.4 Continue to deepen international cooperation on green finance and sustainable finance

The coverage and application scenarios of the CGT will be further expanded. **On the one hand, there will be an expansion of the coverage scope.** Currently, the CGT only covers the environmental objective of mitigating climate change, and only includes the list of economic activities that significantly contribute to mitigating climate change in six major sectors, including energy, manufacturing, construction, transportation, solid waste, and forestry. However, it does not include industries with lower greenhouse gas emissions, such as the information and communication technology (ICT) industry and the service industry. In the future, the CGT will be further expanded. The IPSF, in releasing the CGT, also pointed out the potential direction for its future updates and expansions, including: 1) adding other industries and economic activities, such as the service industry and communication technology; 2) adding other environmental objectives (such as adaptation to climate change); 3) incorporating other features, such as the inclusion of the principle of "no significant harm to the environment" and the minimum safeguards; 4) the participation of other jurisdictions[47]. **On the other hand, there is an expansion of application scenarios.** The CGT has already been applied multiple times in the

[47] Source: FAQs on the *Common Ground Taxonomy* on Sustainable Finance Platform, EU IPSF website [EB/OL], 2022/06[2023/11/24] https://finance.ec.europa.eu/system/files/2022-06/220603-international-platform-sustainable-finance-common-ground-taxonomy-table-faq-chinese_en.pdf

international financial markets, especially when Chinese-funded institutions issue green bonds in overseas markets. In the future, China will further promote the broader application of the CGT. This includes encouraging foreign institutions to use it when issuing green bonds in the domestic panda bond market, and continuing efforts to label existing green bonds and other Chinese green financial products (such as green loans, green funds, green bond ETF and green REITs)[48].

China will continue to promote international consensus and strengthen capacity building in the field of green finance and sustainable finance. China has consistently been actively involved in international cooperation on green finance, playing an important role in promoting international consensus on green finance and facilitating cooperation between the central bank and regulatory authorities in the field of green finance. In the future, China will continue to promote international green finance capacity building and further contribute to the international consensus in this area. In recent years, various international initiatives and mechanisms, including the G20 Sustainable Finance Working Group and the International Platform on Sustainable Finance (IPSF), have made capacity building a crucial topic in international cooperation and called on multilateral development institutions, financial institutions, international organizations and non-governmental institutions to increase investments in capacity building for green finance and enhance collaboration and cooperation among capacity building projects. The Capacity-Building Alliance of Sustainable Investment (CASI), set to officially commence operations in early 2024, is a response to the calls mentioned above. CASI was jointly initiated by the Beijing Institute of Green Finance and Sustainable Development, along with more than 42 domestic and international institutions, including the Silk Road Fund, HKMA Infrastructure Financing Facilitation Office, HSBC, Standard Chartered Bank, Neuberger Berman, etc. CASI will integrate knowledge and best practices in the field of green and sustainable finance from dozens of global institutions. Leveraging its own and its members' networks, CASI intends to provide higher-quality and more impactful capacity-building services in sustainable finance to emerging markets and developing economies through innovative activities such as offline training and offering digital and modular courses. The aim is to support the development of green finance market and explore investable green projects in these regions[49]. CASI is scheduled to commence operations in 2024 and plans to hold offline events in Asia, Africa, the Middle East and Latin America. The establishment of CASI represents another significant step in China's efforts to support the development of sustainable finance and sustainable investment in global southern countries.

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[48]Source: Green Finance Committee, China Society for Finance and Banking: 2022/23 Annual Work Report and 2023/24 Work Outlook, China Green Finance Committee [EB/OL], 2023/9/21 [2023/11/24] https://mp.weixin.qq.com/s/ghCFFs80YzG5mzB5kbOMwA

[49]Source: IFS, in collaboration with over 30 domestic and international institutions, initiates the Capacity-Building Alliance of Sustainable Investment (CASI), Green Finance [EB/OL], 2023/10/18[2023/11/24] https://mp.weixin.qq.com/s/29IBjjEpTUcsg8KKp7FrYQ